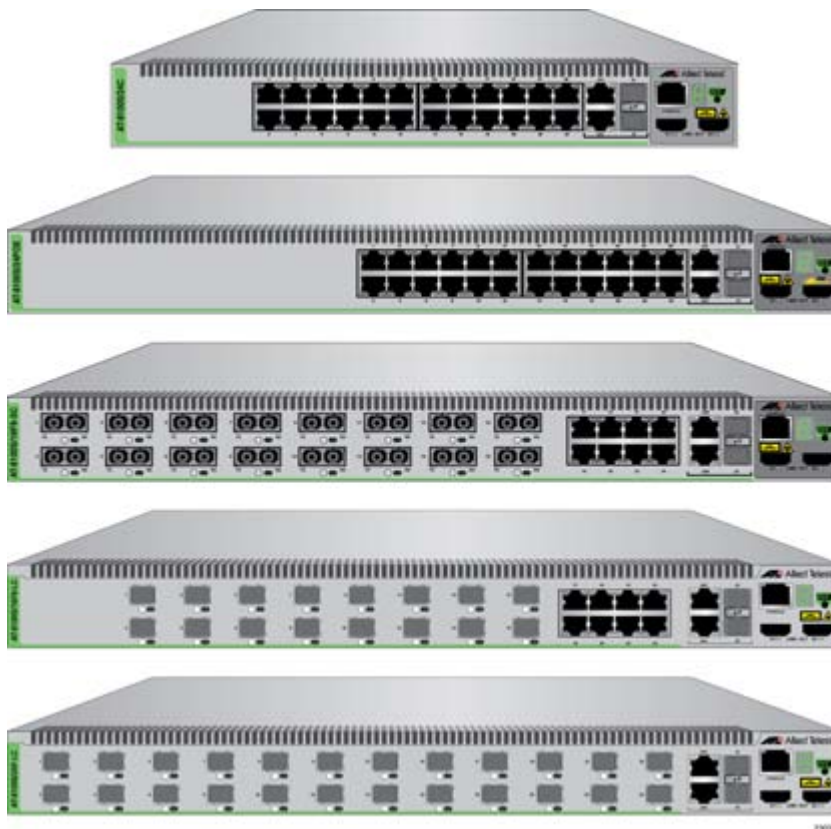




8100S Series

Fast Ethernet Switches

- ❑ AT-8100S/24C
- ❑ AT-8100S/24
- ❑ AT-8100S/24POE
- ❑ AT-8100S/16F8-SC
- ❑ AT-8100S/16F8-LC
- ❑ AT-8100S/24F-LC



Stack Installation Guide

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Electrical Safety and Emissions Standards

This product meets the following standards.

U.S. Federal Communications Commission

Radiated Energy

Note: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Note: Modifications or changes not expressly approved of by the manufacturer or the FCC, can void your right to operate this equipment.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

RFI Emissions FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI Class A, C-TICK, CE

Warning: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.


EMC (Immunity) EN55024

Electrical Safety EN60950-1 (TUV), UL 60950-1 (CULUS)



Laser Safety EN60825

Translated Safety Statements

Important: The  indicates that translations of the safety statement are available in the PDF document “Translated Safety Statements” posted on the Allied Telesis website at www.alliedtelesis.com.

Contents

Preface	13
Document Conventions	14
Contacting Allied Telesis	15
Chapter 1: Overview	17
Features	18
8100S Models	18
10/100 Mbps Twisted Pair Ports	18
Fiber Optic Ports	18
Power over Ethernet	18
10/100/1000 Mbps Twisted Pair Ports	19
SFP Slots	19
Stacking Ports	19
LEDs	20
MAC Address Table	20
Installation Option	20
Management Software and Interfaces	20
Management Methods	20
Fanless Models	20
8100S Twisted Pair Series Switches	21
Front Panels	22
Front Panel Components	22
8100S Fiber Optic Series Switches	23
Hardware Features	23
Front Panels	24
Fiber Optic Ports	25
Back Panel Components	26
Management Panel	27
Model Naming Conventions	28
10/100Base-TX Twisted Pair Ports	30
Speed	30
Duplex Mode	30
Wiring Configuration	30
Maximum Distance	31
Power Over Ethernet	31
Cable Requirements	31
Port Pinouts	31
10/100/1000Base-T Twisted Pair Ports	32
Speed	32
Duplex Mode	32
Wiring Configuration	32
Maximum Distance	33
Power Over Ethernet	33
Cable Requirements	33
Port Pinouts	33
SFP Slots	34
Power Over Ethernet	35
PoE Standards	35
Powered Device Classes	35

Power Budget	36
Port Prioritization	37
Wiring Implementation	38
S1 and S2 Stacking Ports	39
eco-friendly Button	40
LEDs	41
10/100Base-TX Twisted Pair Port LEDs	41
10/100/1000Base-T Twisted Pair Port LEDs	42
100Base-FX Port LEDs	43
SFP Slot LED	44
S1 and S2 Stack Ports LEDs	45
Stack ID LED	46
Console Port	47
Power Supplies	48
Power Connectors	49
Chapter 2: Stacking Overview	51
Stacking Guidelines	52
Master Switch	54
Stacking Port Topologies	55
Active Boot Configuration File	57
Initialization Process	59
Chapter 3: Beginning the Installation	61
Installation Overview	62
Reviewing Safety Precautions	63
Planning the Installation	67
Choosing the Switches of the Stack	67
Choosing a Site	68
Unpacking the Switch	69
8100S Series Switches	69
AT-8100S/24C Switch	70
Chapter 4: Installing and Labeling the Switches in an Equipment Rack	71
Installing the Switches in an Equipment Rack	72
Labeling the Switches	77
Chapter 5: Assigning the Stack ID Numbers and Cabling the Stacking Ports	79
Powering on a Switch	80
Verifying and Setting the Stack ID Numbers	82
Starting a Local Management Session	82
Starting a Telnet Management Session	83
Changing the Stack ID Number	85
Cabling the Stacking Ports	87
Chapter 6: Powering On and Verifying the Stack	91
Powering on AC Switches	92
Monitoring the Initialization Processes	93
Powering On DC Switches	97
Verifying the Installation	101
Chapter 7: Cabling the Network Ports	103
Cabling the Twisted Pair and Fiber Optic Ports	104
Twisted Pair Ports	104
Fiber Optic Ports	105
General Guidelines	105
Installing Optional SFP Transceivers	106
Managing the Stack	110
Local Management	110
Telnet Management	110
Secure Shell Management	111
Web Browser Management	112

SNMP	112
Specifying Ports in the Command Line Interface for Switches in a Stack	112
Chapter 8: Troubleshooting	115
Chapter 9: Adding or Removing Switches	119
Removing or Replacing the Master Switch	120
Uploading the Active Configuration File	121
Removing the Current Master Switch	122
Configuring the New Master Switch	125
Connecting the New Master Switch to the Stack	127
Adding a New Member Switch	128
Removing a Member Switch	130
Appendix A: Technical Specifications	131
Physical Specifications	131
Environmental Specifications	132
Power Specifications	132
Certifications	133
Quality and Reliability	133
RJ-45 Twisted Pair Port Pinouts	134
Fiber Optic Port Specifications	135
RJ-45 Style Serial Console Port Pinouts	137
Stacking Port Pinouts	137

Figures

Figure 1: 8100S Series Switches.....	22
Figure 2: Front Panel Components on the 8100S Twisted Pair Switches.....	22
Figure 3: Front Panels of the 8100S Fiber Optic Series.....	24
Figure 4: Front Panels of the 8100S Fiber Optic Series (Continued).....	25
Figure 5: Back Panels of the Single Power Supply Switches.....	26
Figure 6: Back Panels on the Dual Power Supply Models.....	26
Figure 7: Management Panel.....	27
Figure 8: Model Naming Conventions for the Twisted Pair 8100S Series Switches.....	28
Figure 9: Model Naming Conventions of the Fiber Optic 8100S Series.....	28
Figure 10: 10/100Base-TX Port LEDs.....	41
Figure 11: 10/100/1000Base-T Port LEDs.....	42
Figure 12: 100Base-FX Port LED.....	43
Figure 13: SFP Slot LEDs.....	44
Figure 14: Stacking Port S1 and S2 LEDs.....	45
Figure 15: Stack ID LED.....	46
Figure 16: Duplex-chain and Duplex-ring Configurations.....	56
Figure 17: Switches in an Equipment Rack.....	68
Figure 18: Stack on a Table or Desktop.....	68
Figure 19: Components of the 8100S Series Switches.....	69
Figure 20: Components of the AT-8100S/24C Switch.....	70
Figure 21: Turning the Switch Upside Down.....	72
Figure 22: Removing the Rubber Feet.....	72
Figure 23: Attaching the Brackets to Install the Switch in an Equipment Rack.....	73
Figure 24: Attaching the Brackets to Install the Switch in an Equipment Rack (Continued).....	74
Figure 25: Attaching the Brackets to the AT-8100S/24C Switch to Install the Switch in an Equipment Rack.....	74
Figure 26: Attaching the Brackets to the AT-8100S/24C Switch to Install the Switch in an Equipment Rack (Continued).....	75
Figure 27: Mounting the Switch in an Equipment Rack.....	76
Figure 28: Labelling the Switches.....	77
Figure 29: Connecting the AC Power Cord.....	80
Figure 30: Connecting the Management Cable to the RJ-45 Terminal Port on the Switch.....	83
Figure 31: Connecting the Twisted Pair Cable to a Networking Port on the Switch.....	84
Figure 32: AlliedWare Plus Command Line Prompt.....	85
Figure 33: STACK Command Confirmation Prompt.....	85
Figure 34: Connecting the Stacking Cable.....	87
Figure 35: Example Stack of Four Switches.....	88
Figure 36: Example Stack of Four Switches with a Redundant Path.....	89
Figure 37: Plugging in the AC Power Cords.....	92
Figure 38: Switch Initialization Messages.....	94
Figure 39: Switch Initialization Messages (Continued).....	95
Figure 40: Switch Initialization Messages (Continued).....	96
Figure 41: DC Terminal Block.....	98
Figure 42: Stripped Wire.....	98
Figure 43: Inserting Wires into the DC Terminal Block.....	99
Figure 44: SHOW STACK Command.....	101
Figure 45: Removing the Dust Plug from an SFP Slot.....	107
Figure 46: Installing an SFP Transceiver.....	107
Figure 47: Removing the Dust Cover from the SFP Module.....	108
Figure 48: Positioning the SFP Handle in the Upright Position.....	108
Figure 49: Connecting the Fiber Optic Cable to the SFP Module.....	109

Figure 50: PORT Parameter in the Command Line Interface.....	112
Figure 51: SHOW BOOT Command.....	121
Figure 52: Removing the Network Cables	122
Figure 53: Removing the Fiber Optic Cable from the SFP Module.....	123
Figure 54: Installing the Dust Cover on the SFP Module.....	123
Figure 55: Removing the SFP Module.....	124
Figure 56: Installing the Dust Cover in the SFP Slot.....	124
Figure 57: Removing the Stacking Cables.....	125
Figure 58: RJ-45 Connector and Port Pin Layout.....	134
Figure 59: Stacking Port Pin Layout (Front View).....	137

Tables

Table 1: Hardware Features of the 8100S Twisted Pair Series	21
Table 2: Hardware Features of the 8100S Fiber Optic Series	23
Table 3: General Specifications of the Fiber Optic Ports	25
Table 4: Model Naming Conventions for the Twisted Pair 8100L and 8100S Series Switches	28
Table 5: Model Naming Conventions of the Fiber Optic 8100S Series Switches	29
Table 6: Twisted Pair Cable Requirements for the 10/100Base-TX Ports	31
Table 7: Twisted Pair Cable for the 10/100/1000Base-T Ports	33
Table 8: Combo Ports	34
Table 9: IEEE Powered Device Classes	36
Table 10: 10/100Base-TX Port LEDs	41
Table 11: 10/100/1000Base-T Port LEDs	42
Table 12: 100Base-FX Port LED	43
Table 13: SFP Slot LED	44
Table 14: Stacking Port LED	45
Table 15: Installation Procedures	62
Table 16: LEDs and Management Software Initialization	93
Table 17: Product Dimensions	131
Table 18: Product Weights	131
Table 19: Ventilation Requirements	132
Table 20: Environmental Specifications	132
Table 21: Maximum Power Consumptions	132
Table 22: Input Voltages	132
Table 23: Product Certifications	133
Table 24: MTBF	133
Table 25: Pin Signals for 10 and 100 Mbps	134
Table 26: Pin Signals - 1000 Mbps	135
Table 27: Fiber Optic Port Specifications for the AT-8100S/16F8-SC Switch	135
Table 28: Fiber Optic Port Specifications for the AT-8100S/16F8-LC and AT-8100S/24F-LC Switches	136
Table 29: RJ-45 Style Serial Console Port Pin Signals	137
Table 30: Stacking Port Pin Signals	137

Preface

This guide contains instructions on how to install the 8100S Series of Fast Ethernet switches in a stack configuration. For instructions on how to install the switches as stand-alone units, refer to the *Stand-alone Switch Installation Guide for 8100L and 8100S Series Switches*.

This preface contains the following sections:

- ❑ “Document Conventions” on page 14
- ❑ “Contacting Allied Telesis” on page 15

Note

This guide does not include the AT-8100S/48 and AT-8100S/48POE Switches. The initial release of the management software supports the 48-port switches as stand-alone units, but not in a stack. For further information, contact your Allied Telesis representative.

Document Conventions

This document uses the following conventions:

Note

Notes provide additional information.



Caution

Cautions inform you that performing or omitting a specific action may result in equipment damage or loss of data.



Warning

Warnings inform you that performing or omitting a specific action may result in bodily injury.

Contacting Allied Telesis

If you need assistance with this product, you may contact Allied Telesis technical support by going to the Support & Services section of the Allied Telesis web site at **www.alliedtelesis.com/support**. You can find links for the following services on this page:

- ❑ 24/7 Online Support — Enter our interactive support center to search for answers to your product questions in our knowledge database, to check support tickets, to learn about RMAs, and to contact Allied Telesis technical experts.
- ❑ USA and EMEA phone support — Select the phone number that best fits your location and customer type.
- ❑ Hardware warranty information — Learn about Allied Telesis warranties and register your product online.
- ❑ Replacement Services — Submit a Return Merchandise Authorization (RMA) request via our interactive support center.
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- ❑ Software Downloads — Download the latest software releases for your managed products.

For sales or corporate information, go to **www.alliedtelesis.com/purchase** and select your region.

Chapter 1

Overview

This chapter contains the following sections:

- ❑ “Features” on page 18
- ❑ “8100S Twisted Pair Series Switches” on page 21
- ❑ “8100S Fiber Optic Series Switches” on page 23
- ❑ “Back Panel Components” on page 26
- ❑ “Management Panel” on page 27
- ❑ “Model Naming Conventions” on page 28
- ❑ “10/100Base-TX Twisted Pair Ports” on page 30
- ❑ “10/100/1000Base-T Twisted Pair Ports” on page 32
- ❑ “SFP Slots” on page 34
- ❑ “Power Over Ethernet” on page 35
- ❑ “S1 and S2 Stacking Ports” on page 39
- ❑ “eco-friendly Button” on page 40
- ❑ “LEDs” on page 41
- ❑ “Console Port” on page 47
- ❑ “Power Supplies” on page 48
- ❑ “Power Connectors” on page 49

Note

This guide contains instructions on how to install the 8100S Series switches in a stack configuration with the S1 and S2 stacking ports. For instructions on how to install the switches as stand-alone units, refer to the *Stand-alone Switch Installation Guide for 8100L and 8100S Series Switches*.

Note

This guide does not include the AT-8100S/48 and AT-8100S/48POE Switches. The initial release of the management software supports the 48-port switches as stand-alone units, but not in a stack. For further information, contact your Allied Telesis representative.

Features

Here is a list of the switches and their features:

8100S Models

Here are the 8100S Series switches:

- ☐ AT-8100S/24C
- ☐ AT-8100S/24
- ☐ AT-8100S/24POE
- ☐ AT-8100S/16F8-SC
- ☐ AT-8100S/16F8-LC
- ☐ AT-8100S/24F-LC

10/100 Mbps Twisted Pair Ports

Here are the basic features of the 10/100 Mbps twisted pair ports:

- ☐ 8 or 24 ports per switch
- ☐ 10Base-T and 100Base-TX compliant
- ☐ IEEE 802.3u Auto-Negotiation compliant
- ☐ Auto-MDI/MDIX
- ☐ 100 meters (328 feet) maximum operating distance
- ☐ IEEE 802.3x flow control in 10/100Base-TX full-duplex operation
- ☐ IEEE 802.3x backpressure in 10/100Base-TX half-duplex operation
- ☐ Support for jumbo frames up to 10KB
- ☐ RJ-45 connectors

Fiber Optic Ports

Here are the basic features of the fiber optic ports:

- ☐ 16 or 24 ports per switch
- ☐ 100Base-FX compliant
- ☐ Duplex SC or duplex LC
- ☐ Maximum distance of 2 kilometers (1.24 miles) for the fiber optic ports on the AT-8100S/16F8-LC, AT-8100S/16F8-SC, and AT-8100S/24F-LC Switches

Power over Ethernet

Here are the basic features of Power over Ethernet (PoE):

- ☐ PoE and PoE+ supported on the 10/100Base-TX ports on the AT-8100S/24POE Switch
- ☐ Powered device classes 0 to 4
- ☐ Power budget of 370 watts for the AT-8100S/24POE Switch

- ☐ Port prioritization

10/100/1000 Mbps Twisted Pair Ports

Here are the basic features of the 10/100/1000 Mbps twisted pair ports:

- ☐ Two ports per switch
- ☐ 10Base-T, 100Base-TX, and 1000Base-T compliant
- ☐ IEEE 802.3u Auto-Negotiation compliant
- ☐ Auto-MDI/MDIX
- ☐ 100 meters (328 feet) maximum operating distance
- ☐ IEEE 802.3x flow control in 10/100Base-TX full-duplex operation
- ☐ IEEE 802.3x backpressure in 10/100Base-TX half-duplex operation
- ☐ IEEE 803.3z 1000Base-T flow control
- ☐ Support for jumbo frames up to 10KB
- ☐ RJ-45 connectors

SFP Slots

Here are the basic features of the SFP slots:

- ☐ Two slots per switch
- ☐ Support 100Mbps 100Base-FX or 1000Mbps 1000Base-SX/LX transceivers

Note

The SFP slots are paired with the 10/100/1000Base-TX twisted pair ports on the switch to form combo ports. For information, refer to “SFP Slots” on page 34.

Note

SFP transceivers must be purchased separately. For a list of supported transceivers, contact your Allied Telesis distributor or reseller.

Stacking Ports

Here are the basic features of the stacking ports on the 8100S Series switches:

- ☐ Two stacking ports
- ☐ 10Gbps total bandwidth
- ☐ High-definition Multimedia Interface (HDMI) connectors

LEDs

Here are the port LEDs:

- ☐ Duplex mode and link/activity LEDs for the twisted pair ports
- ☐ Link/activity LEDs for the 100Base-FX fiber optic ports
- ☐ Link/activity LEDs for the SFP slots
- ☐ Link LEDs for the stacking ports
- ☐ Stack ID number LED
- ☐ eco-friendly button to turn off the LEDs to conserve electricity

MAC Address Table

Here are the basic features of the MAC address tables of the switches:

- ☐ Storage capacity of 16,000 MAC address entries
- ☐ Automatic learning and aging

Installation Option

Here is the installation option for a stack of 8100S Series switches:

- ☐ 19-inch equipment rack



Warning

You should install the switches of a stack in a standard 19-inch equipment rack. Allied Telesis does not recommend installing a stack on a table or desktop because it may create a hazardous work area.

Management Software and Interfaces

Here are the management software and management interfaces:

- ☐ AlliedWare Plus Management Software
- ☐ Command line interface
- ☐ Web browser interface

Management Methods

Here are the methods for managing the switches:

- ☐ Local management through the Console port
- ☐ Remote Telnet and Secure Shell management
- ☐ Remote HTTP and HTTPS web browser management
- ☐ SNMPv1, v2c, and v3

Fanless Models

Here are the 8100S Series switches that do not have fans:

- ☐ AT-8100S/24 Switch
- ☐ AT-8100S/24C Switch

8100S Twisted Pair Series Switches

The three twisted pair models in the 8100S Series are listed here:

- ❑ AT-8100S/24C
- ❑ AT-8100S/24
- ❑ AT-8100S/24POE

For information on the fiber optic models, refer to “8100S Fiber Optic Series Switches” on page 23.

Table 1 lists the hardware features of the twisted pair models.

Table 1. Hardware Features of the 8100S Twisted Pair Series

Feature	24C	24	24POE
Number of 10/100Base-TX Ports	24	24	24
Number of 10/100/1000Base-T Ports	2	2	2
Number of SFP Slots for 100Mbps 100Base-FX or 1000Mbps 1000Base-SX/LX Transceivers ¹	2	2	2
Stacking Ports	Yes	Yes	Yes
Power over Ethernet	No	No	Yes
Power over Ethernet Budget (Watts)	-	-	370
Powered Device Classes	-	-	0 to 4
Number of Power Supplies	1	2	2
Power Supply Type	AC	AC or DC	AC
Console Management Port	Yes	Yes	Yes
Ventilation Fan	No	No	Yes

1. The SFP transceiver slots and 10/100/1000Base-T ports are paired together to form combo ports. Refer to “SFP Slots” on page 34 for background information.

Front Panels The front panels of the 8100S Series switches with twisted pair ports are shown in Figure 1.

AT-8100S/24C



AT-8100S/24



AT-8100S/24POE

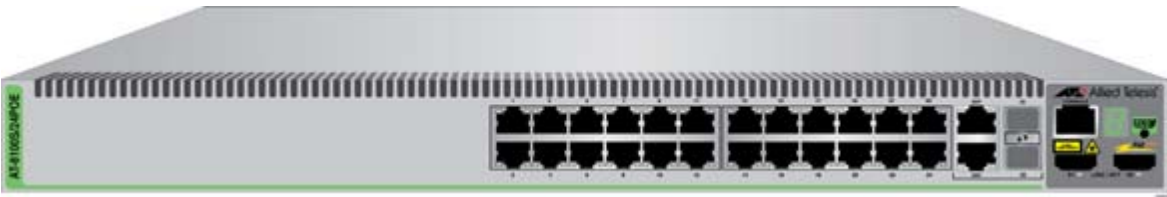


Figure 1. 8100S Series Switches

Front Panel Components Figure 2 identifies the front panel components on the models with twisted pair ports.

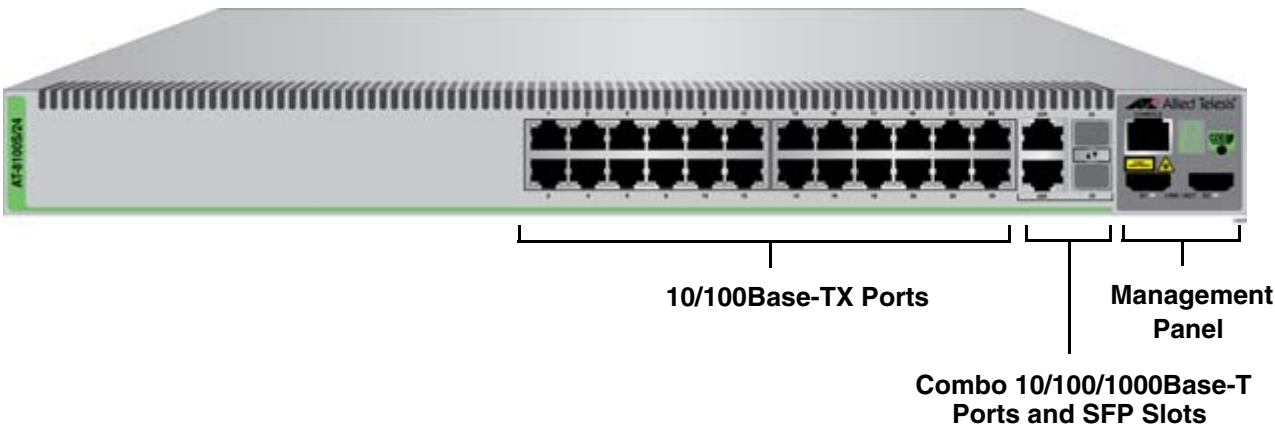


Figure 2. Front Panel Components on the 8100S Twisted Pair Switches

8100S Fiber Optic Series Switches

The three fiber optic models in the 8100S Series are listed here:

- ❑ AT-8100S/16F8-SC
- ❑ AT-8100S/16F8-LC
- ❑ AT-8100S/24F-LC

Hardware Features Table 2 lists the hardware features of the fiber optic 8100S Series switches.

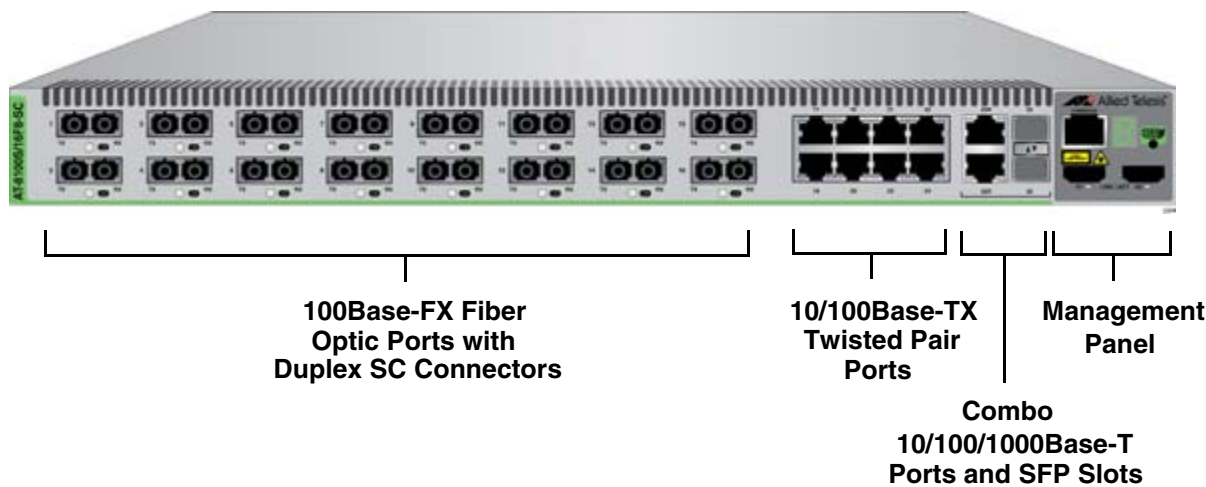
Table 2. Hardware Features of the 8100S Fiber Optic Series

Feature	16F8-SC	16F8-LC	24F-LC
Number of 100Base-FX Fiber Optic Ports	16	16	24
Connectors	Duplex SC	Duplex LC	Duplex LC
Maximum Distance per Port	2 kilometers (1.24 miles)	2 kilometers (1.24 miles)	2 kilometers (1.24 miles)
Number of 10/100Base-TX Ports	8	8	0
Number of 10/100/1000Base-T Ports	2	2	2
Number of SFP Slots for 100Mbps 100Base-FX or 1000Mbps 1000Base-SX/LX Transceivers ¹	2	2	2
Stacking Ports	Yes	Yes	Yes
Power over Ethernet	No	No	No
Number of Power Supplies	2	2	2
Power Supply Type	AC	AC	AC
Console Management Port	Yes	Yes	Yes
Ventilation Fan	Yes	Yes	Yes

1. The SFP transceiver slots and the 10/100/1000Base-T ports are paired together to form combo ports. Refer to “SFP Slots” on page 34 for background information.

Front Panels The front panels of the fiber optic switches are shown in Figure 3 here and Figure 4 on page 25.

AT-8100S/16F8-SC



AT-8100S/16F8-LC

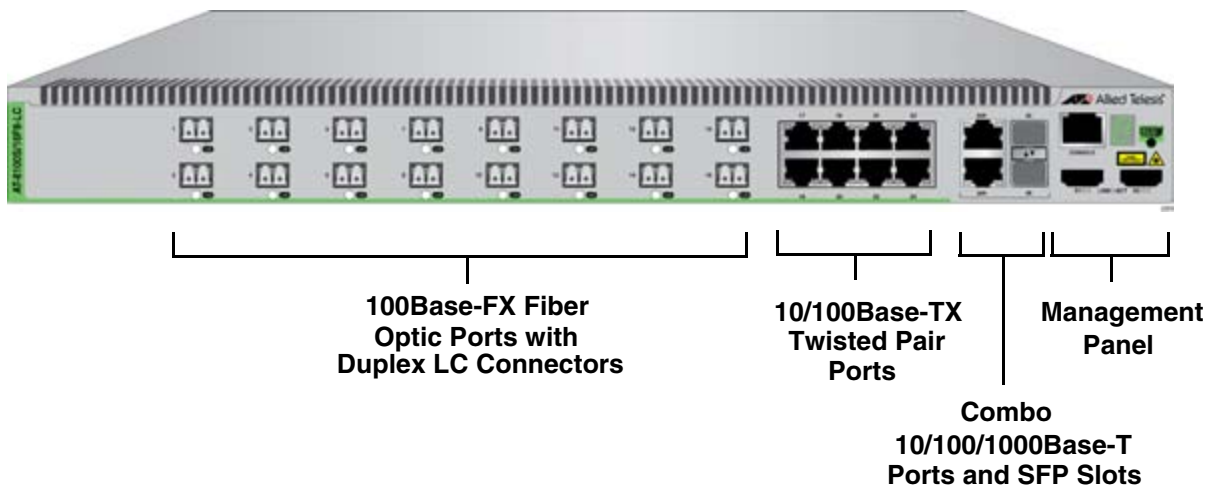


Figure 3. Front Panels of the 8100S Fiber Optic Series

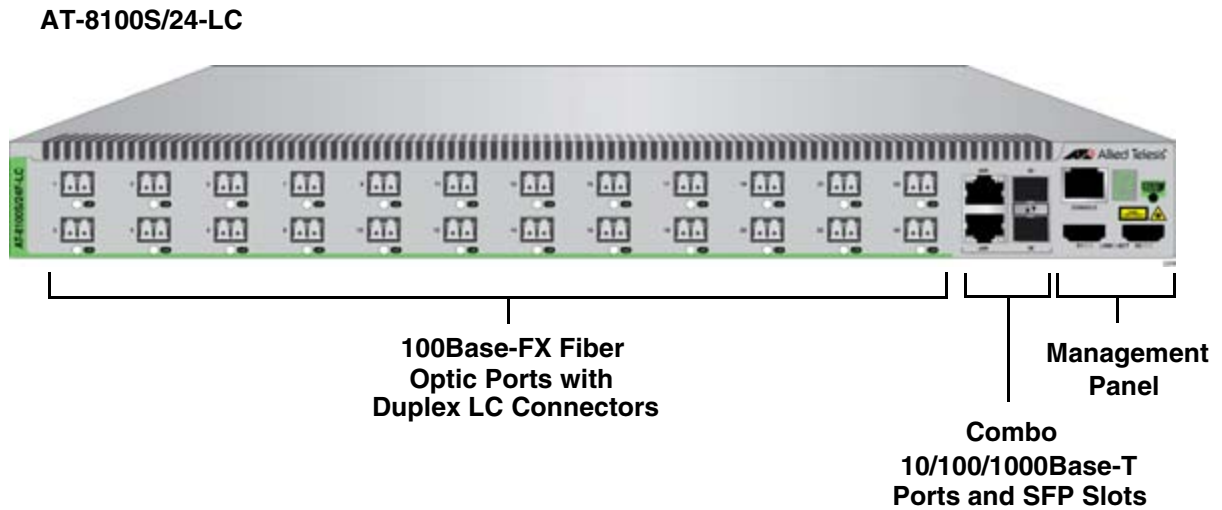


Figure 4. Front Panels of the 8100S Fiber Optic Series (Continued)

Fiber Optic Ports Table 3 lists the general specifications of the fiber optic ports on the fiber optic switches.

Table 3. General Specifications of the Fiber Optic Ports

Feature	16F8-SC	16F8-LC	24F-LC
Number of Fiber Optic Ports	16	16	24
Connector	Duplex SC	Duplex LC	Duplex LC
Wavelength	1310 nm for transmitting and receiving.	1310 nm for transmitting and receiving.	1310 nm for transmitting and receiving.
Standard	100Base-FX	100Base-FX	100Base-FX
Speed	100 Mbps	100 Mbps	100 Mbps
Maximum Distance	2 kilometers (1.24 miles)	2 kilometers (1.24 miles)	2 kilometers (1.24 miles)
Fiber Optic Cable	50/125 or 62.5/125 μ m (core/cladding) multimode fiber optic cable	50/125 or 62.5/125 μ m multimode fiber optic cable	50/125 or 62.5/125 μ m multimode fiber optic cable

Back Panel Components

Figure 5 shows the back panel of the AT-8100S/24C Switch, which has a single power supply.

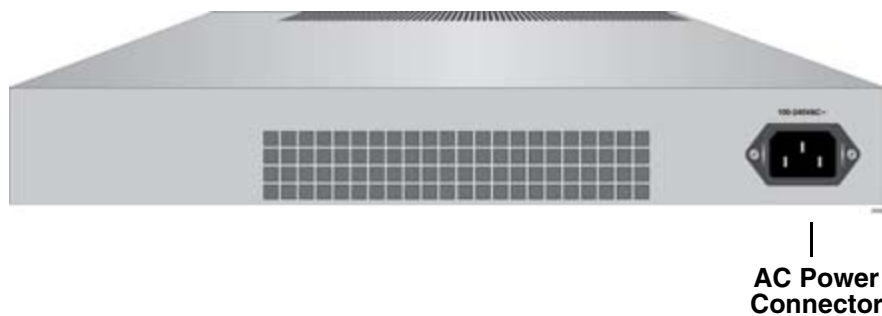


Figure 5. Back Panels of the Single Power Supply Switches

Figure 6 shows the back panels of the dual power supply models.

Dual AC Power Supply Models



Dual DC Power Supply Models



Figure 6. Back Panels on the Dual Power Supply Models

Management Panel

Figure 7 identifies the components of the management panel.

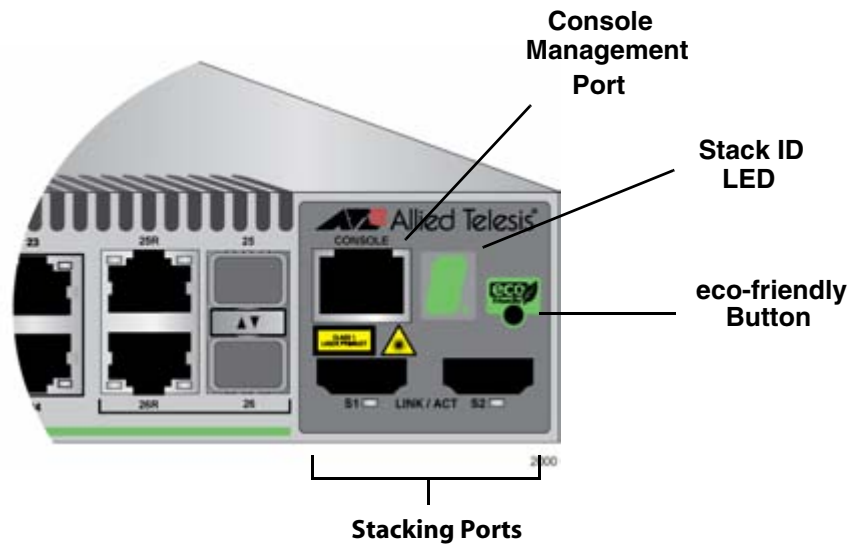


Figure 7. Management Panel

Model Naming Conventions

The letters and numbers in the model names identify the hardware features of the switches. The naming conventions for the twisted pair 8100S Series switches are identified in Figure 8.

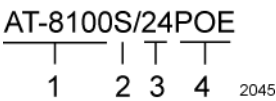


Figure 8. Model Naming Conventions for the Twisted Pair 8100S Series Switches

The conventions are defined in Table 4.

Table 4. Model Naming Conventions for the Twisted Pair 8100L and 8100S Series Switches

Convention	Definition
1	This is the product name.
2	The letter “S” indicates that the model is stackable. The letter “L” indicates that the model is not stackable. (The non-stackable switches are not described in this manual. For installation instructions, refer to the <i>Stand-alone Switch Installation Guide for 8100L and 8100S Series Switches</i> .)
3	This is the number of 10/100Base-TX ports.
4	The letters “POE” indicate support for Power over Ethernet.

The letter “C” in the AT-8100S/24C model name denotes that the unit, which has just one power supply, is smaller and more compact than the other models.

The model naming conventions for the fiber optic 8100S Series switches are identified in Figure 9.

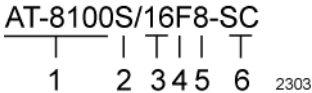


Figure 9. Model Naming Conventions of the Fiber Optic 8100S Series

The conventions are defined in Table 5.

Table 5. Model Naming Conventions of the Fiber Optic 8100S Series Switches

Convention	Definition
1	This is the product name.
2	The letter “S” indicates that the model is stackable.
3	This is the number of 100Base-FX fiber optic ports.
4	The letter “F” signifies fiber optic.
5	This is the number of 10/100Base-TX ports. The fiber optic switches that have 10/100Base-TX ports are the AT-8100S/16F8-SC and AT-8100S/16F8-LC Switches.
6	<p>This identifies the type of fiber optic connector. The connectors are listed here:</p> <ul style="list-style-type: none"> ❑ SC - Duplex SC ❑ LC - Duplex LC

10/100Base-TX Twisted Pair Ports

The switches have 8 or 24 10/100Base-TX ports.

Speed The ports can operate at either 10 or 100 Mbps. The speeds may be set manually using the management software or automatically with Auto-Negotiation (IEEE 802.3u), the default setting.

Duplex Mode The twisted pair ports can operate in either half- or full-duplex mode. The duplex mode determines the manner in which a port transmits data. A port set to half-duplex can either transmit or receive data at one time, while a port operating in full-duplex can transmit and receive data at the same time. The best network performance is achieved with the full-duplex setting, but not all network equipment is designed to support that duplex mode.

The duplex modes, like port speeds, may be set manually using the management software or automatically with Auto-Negotiation (IEEE 802.3u), the default setting.

The speed and duplex mode settings of a port may be set independently of each other. For example, a port may be configured such that its speed is set manually while its duplex mode is established through Auto-Negotiation.

Note

A switch port that is connected to a network device that does not support Auto-Negotiation and has a fixed duplex mode of full-duplex should not set its duplex mode with Auto-Negotiation. A duplex-mode mismatch in which a switch port and a network device operate at different duplex modes, may occur. The duplex modes of switch ports that are connected to network devices that do not support Auto-Negotiation should be set manually through the management software.

Wiring Configuration The wiring configuration of a port can be MDI or MDI-X. The wiring configurations of a switch port and a network device connected with straight-through twisted pair cabling have to be opposite, such that one device is using MDI and the other MDI-X. For instance, a switch port has to be set to MDI-X if it is connected to a network device set to MDI.

You may set the wiring configurations of the ports manually or let the switch configure them automatically with auto-MDI/MDI-X (IEEE 802.3ab-compliant). This feature enables the switch to negotiate with network devices to establish the proper settings, so that the ports on the devices are using different wiring configurations.

Maximum Distance The ports have a maximum operating distance of 100 meters (328 feet).

Power Over Ethernet The 10/100Base-TX ports on the AT-8100S/24POE Switch supports Power over Ethernet (PoE), which is a standard whereby DC power is provided by the switch to network devices over the network twisted pair cables. The switch supports PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at). For background information, refer to “Power Over Ethernet” on page 35.

Cable Requirements The cable requirements of the ports are given in Table 6.

Table 6. Twisted Pair Cable Requirements for the 10/100Base-TX Ports

Cable Type	10Mbps			100Mbps		
	Non-PoE	PoE	PoE+	Non-PoE	PoE	PoE+
Standard TIA/EIA 568-B-compliant Category 3 shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz.	Yes	No	No	Yes	No	No
Standard TIA/EIA 568-A-compliant Category 5 shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.	Yes	Yes	No	Yes	Yes	No
Standard TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.	Yes	Yes	Yes	Yes	Yes	Yes
Standard TIA/EIA 568-B-compliant Category 6 or 6a shielded cabling.	Yes	Yes	Yes	Yes	Yes	Yes

Port Pinouts Refer to Table 25 on page 134 for the port pinouts of the 10/100Base-TX ports.

10/100/1000Base-T Twisted Pair Ports

The switches have two 10/100/1000Base-T ports. These ports are paired with SFP slots to form combo ports.

Speed The ports can operate at 10, 100, or 1000 Mbps. The speeds may be set manually using the management software or automatically with Auto-Negotiation (IEEE 802.3u), the default setting.

Note

The ports must be set to Auto-Negotiation to function at 1000 Mbps. They are not compatible with devices that are not IEEE 802.3u compliant.

Duplex Mode The twisted pair ports can operate in either half- or full-duplex mode. The duplex modes, like port speeds, may be set manually using the management software or automatically with Auto-Negotiation (IEEE 802.3u), the default setting.

The speed and duplex mode settings of a port may be set independently of each other. For example, a port may be configured such that its speed is set manually while its duplex mode is established through Auto-Negotiation.

Note

A switch port that is connected to a network device that does not support Auto-Negotiation and has a fixed duplex mode of full-duplex should not set its duplex mode with Auto-Negotiation. A duplex-mode mismatch in which a switch port and a network device operate at different duplex modes, may occur. The duplex modes of switch ports that are connected to network devices that do not support Auto-Negotiation should be set manually through the management software.

**Wiring
Configuration**

The wiring configuration of a port can be MDI or MDI-X. The wiring configurations of a switch port and a network device connected with straight-through twisted pair cabling have to be opposite, such that one device is using MDI and the other MDI-X. For instance, a switch port has to be set to MDI-X if it is connected to a network device set to MDI.

You may set the wiring configurations of the ports manually or let the switch configure them automatically with auto-MDI/MDI-X (IEEE 802.3ab-compliant). This feature enables the switch to negotiate with network devices to establish the proper settings, so that the ports on the devices are using different wiring configurations.

Maximum Distance

The ports have a maximum operating distance of 100 meters (328 feet).

Power Over Ethernet

The 10/100/1000Base-T ports on the AT-8100S/24POE Switch does not support PoE.

Cable Requirements

The cable requirements of the ports are given in Table 7.

Table 7. Twisted Pair Cable for the 10/100/1000Base-T Ports

Cable Type	10Mbps	100Mbps	1000Mbps
Standard TIA/EIA 568-B-compliant Category 3 shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz.	Yes	Yes	No
Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.	Yes	Yes	Yes
Standard TIA/EIA 568-B-compliant Category 6 or 6a shielded cabling.	Yes	Yes	Yes

Port Pinouts

Refer to Table 25 on page 134 and Table 26 on page 135 for the port pinouts to the 10/100/1000Base-T ports.

SFP Slots

The switches have two slots for 100Mbps 100Base-FX or 1000Mbps 1000Base-SX/LX fiber optic transceivers. You may add transceivers to connect the switches to other network devices over large distances, build a high-speed backbone network between network devices, or connect high-speed devices, such as servers, to your network.

The switches support a variety of short and long distance, 100 and 1000 Mbps fiber optic SFP modules. For a list of supported SFP modules, contact your Allied Telesis representative or visit our web site.

The two SFP slots are paired with the 10/100/1000Base-T ports to form combo ports. The combo ports are listed in Table 8.

Table 8. Combo Ports

Model	10/100/1000 Base-T Port	SFP Slot
AT-8100S/24C, AT-8100S/24, AT-8100S/24POE, AT-8100S/ 16F8-LC, AT-8100S/16F8-SC, and AT-8100S/24F-LC	25R	25
	26R	26

The rules for using the combo ports are listed here:

- ❑ Only one port in a pair can be active at a time.
- ❑ The twisted pair port is the active port when the companion SFP slot is empty, or when an SFP module is installed but has not established a link to an end node.
- ❑ The switch automatically deactivates the twisted pair port of a combo port when the companion SFP module establishes a network link.
- ❑ The switch automatically reactivates the twisted pair port whenever the companion SFP module loses its network link.
- ❑ In nearly all cases, a twisted pair port and an SFP module share the same configuration settings, including port settings, VLAN assignments, access control lists, and spanning tree.
- ❑ An exception to the shared settings is port speed. If you disable Auto-Negotiation on a twisted pair port and set the speed and duplex mode manually, the speed reverts to Auto-Negotiation when an SFP module establishes a link with an end node.

Power Over Ethernet

The AT-8100S/24POE Switch features Power over Ethernet (PoE) on the 10/100Base-TX ports. PoE is used to supply power to network devices over the same twisted pair cables that carry the network traffic.

The main advantage of PoE is that it can make it easier to install a network. The selection of a location for a network device is often limited by whether there is a power source nearby. This often limits equipment placement or requires the added time and cost of having additional electrical sources installed. But with PoE, you can install PoE-compatible devices wherever they are needed without having to worry about whether there are power sources nearby.

A device that provides PoE to other network devices is referred to as power sourcing equipment (PSE). The AT-8100S/24POE Switch acts as a PSE unit by adding DC power to the network cable, thus functioning as a central power source for other network devices.

Devices that receive their power from a PSE are called *powered devices* (PD). Examples include wireless access points, IP telephones, webcams, and even other Ethernet switches.

The switch automatically determines whether or not a device connected to a port is a powered device. Ports that are connected to network nodes that are not powered devices (that is, devices that receive their power from another power source) function as regular Ethernet ports, without PoE. The PoE feature remains activated on the ports but no power is delivered to the devices.

PoE Standards

The AT-8100S/24POE Switch supports these PoE standards:

- ❑ PoE (IEEE 802.3af): This standard provides up to 15.4 watts at the switch port to support powered devices that require up to 12.95 watts.
- ❑ PoE+ (IEEE 802.3at): This standard provides up to 30.0 watts at the switch port to support powered devices that require up to 25.5 watts.

Powered Device Classes

Powered devices are grouped into the five classes listed in Table 9 on page 36. The classes are based on the amount of power the devices require. The AT-8100S/24POE Switch supports all five classes.

Table 9. IEEE Powered Device Classes

Class	Maximum Power Output from a Switch Port	Power Ranges of the PDs
0	15.4W	0.44W to 12.95W
1	4.0W	0.44W to 3.84W
2	7.0W	3.84W to 6.49W
3	15.4W	6.49W to 12.95W
4	30.0W	12.95W to 25.5W

Power Budget

The AT-8100S/24POE Switch has a power budget of 370 watts. This is the maximum amount of power the switches can provide at one time to the powered devices.

The PoE switch has two power supplies. Each power supply is responsible for providing 185 watts, or half, of the power budget. Both power supplies must be connected to AC power sources for the switch to provide the full 370 watts. The power budget is reduced to 185 watts if only one power supply is connected to a power source.

The power requirements of the PoE devices determine the maximum number of devices the switch can support at one time. So long as the total power requirements of the powered devices is less than the power budget of the switch, the switch can supply power to all of the devices. But if the total power requirements exceed the power budget, the switch denies power to one or more ports using a mechanism referred to as port prioritization.

To determine whether the power requirements of the PoE devices you plan to connect to the switch exceed its power budget, refer to their documentation for their power requirements and add the requirements together. The switch should be able to power all of the devices simultaneously as long as the total is below its power budget. If the total exceeds the available power budget, you should consider reducing the number of PoE devices so that all of the devices receive power. Otherwise, the switch will power a subset of the devices, based on port prioritization.

The switch can handle different power requirements on different ports, enabling you to connect different classes of PoE equipment to the ports.

Port Prioritization

If the power requirements of the powered devices exceed the switch's power budget, the switch will deny power to some ports based on a system called port prioritization. You may use this mechanism to ensure that powered devices critical to the operations of your network are given preferential treatment by the switch in the distribution of power should the demands of the devices exceed the available capacity.

There are three priority levels:

- ☐ Critical
- ☐ High
- ☐ Low

Ports set to the Critical level, the highest priority level, are guaranteed power before any of the ports assigned to the other two priority levels. Ports that are connected to your most critical powered devices should be assigned to this level. Ports assigned to the other priority levels receive power only if all the critical ports are receiving power. If there is not enough power to support all the ports set to the Critical priority level, power is distributed based on port number, in ascending order.

The High level is the second highest level. Ports set to this level receive power only if all the ports set to the Critical level are already receiving power. If there is not enough power to support all of the ports set to the High priority level, power is provided to the ports based on port number, in ascending order.

The lowest priority level is Low. This is the default setting. Ports set to this level only receive power if all of the ports assigned to the other two levels are already receiving power. As with the other levels, if there is not enough power to support all of the ports set to the Low priority level, power is provided to the ports based on port number, in ascending order.

Power allocation is dynamic. Ports supplying power to powered devices may cease power transmission if the switch's power budget is at maximum usage and new powered devices, connected to ports with higher priorities, become active.

You can use port prioritization on dual power supply PoE switches to protect your important networking devices from loss of power should one of the power supplies fail or lose power. By limiting the power requirements of the critical devices connected to a switch to less than 185 watts, the PoE power provided by a single power supply, a switch will be able to continue to power the critical devices even if it has only one functional power supply.

Wiring Implementation

The IEEE 802.3af standard defines two methods by which a PSE, such as the switch, can transmit DC power over twisted pair cables to PDs. These methods, known as modes A and B, identify the wire strands the switch should use when sending DC power to a PD.

Twisted pair cabling typically consists of eight strands. With 10Base-T and 100Base-TX devices, the strands connected to pins 1, 2, 3, and 6 on the RJ-45 connectors carry the network traffic while strands connected to pins 4, 5, 7, and 8 are unused. With 1000Base-T devices, all eight strands are used to carry network data.

It takes four strands to deliver DC power to a PD. With Mode A, the power is delivered on pins 1, 2, 3, and 6. These are the same pins in 10Base-T and 100Base-TX devices that carry the network data. With mode B, the power is provided over the spare strands.

The ports on the AT-8100S/24POE Switch deliver the power using pins 4, 5, 7, and 8, which corresponds to mode B in the IEEE 802.3af standard.

Powered devices that comply with the IEEE 802.3af standard are required to support both power delivery methods. Legacy devices that do not comply with the standard will work with the switch if they are powered on pins 4, 5, 7, and 8.

S1 and S2 Stacking Ports

The switch may be used as a stand-alone unit or as part of a stack in which multiple units are interconnected via the S1 and S2 stacking ports on the front panels. Compared to stand-alone switches, which function as independent units, the switches of a stack synchronize their actions to form a single, logical unit so that the switching operations, like spanning tree protocols, virtual LANs, and static port trunks, are able to span across all the units.

The two principal advantages of stacks are:

- ❑ You can manage multiple units simultaneously, thus simplifying network management.
- ❑ You have more flexibility in how you configure some of the features. For instance, a static port trunk on a stand-alone switch has to consist of ports from the same switch. In contrast, a static trunk on a stack may consist of ports from different switches in the same stack.

For more information, refer to Chapter 2, “Stacking Overview” on page 51.

This guide explains how to install the units in a stack. For instructions on how to install the switches as stand-alone units, refer to the *Stand-alone Switch Installation Guide for 8100L and 8100S Series Switches*.

eco-friendly Button

You may turn off the port LEDs to conserve electricity when you are not monitoring the switch. The LEDs may be toggled with the eco-friendly button on the front panel of the switch or the ECOFRIENDLY LED and NO ECOFRIENDLY LED commands in the Global Configuration mode of the command line interface.

Toggling the LEDs on and off does not interfere with the network operations of the device. The Stack ID LED is always on.

Note

When checking or troubleshooting the network connections to the ports on the switch, you should always check to be sure that the LEDs are on by either pressing the eco-friendly button or issuing the ECOFRIENDLY LED and NO ECOFRIENDLY LED commands in the Global Configuration mode of the command line interface.

LEDs

Here are the descriptions of the switch's LEDs.

10/100Base-TX Twisted Pair Port LEDs

The 10/100Base-TX twisted pair ports have link/activity and duplex mode LEDs.

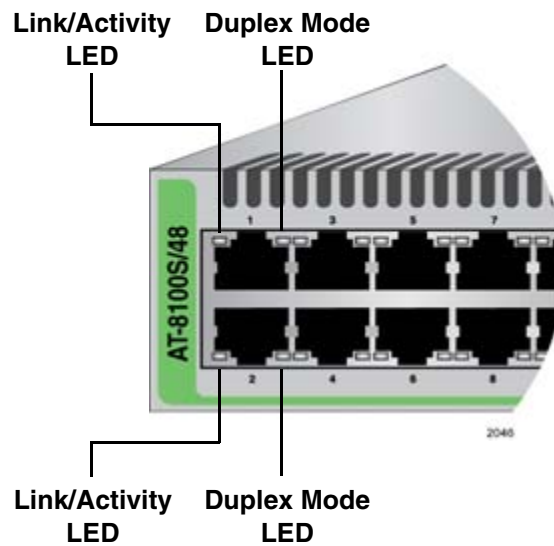


Figure 10. 10/100Base-TX Port LEDs

The LEDs are described in this table.

Table 10. 10/100Base-TX Port LEDs

LED	State	Description
Link/Activity	Off	The port has not established a link to an end node.
	Solid green	The port has established a link to an end node.
	Flashing green	The port is receiving or transmitting packets.
Duplex Mode	Off	The port is operating in half-duplex mode.
	Solid green	The port is operating in full-duplex mode.

Here are the LED guidelines:

- ❑ The LEDs do not display port speed. That information may be viewed using the management software.
- ❑ The LEDs on the AT-8100S/24POE Switch do not display PoE information. That information may be viewed using the management software.
- ❑ If the port LEDs are off, the switch may be operating in the low power mode. To toggle on the LEDs, use the eco-friendly button.

**10/100/1000Base-T
Twisted Pair Port
LEDs**

The twisted pair ports in the combo ports have link/activity and duplex mode LEDs, just like the 10/100Base-TX ports.

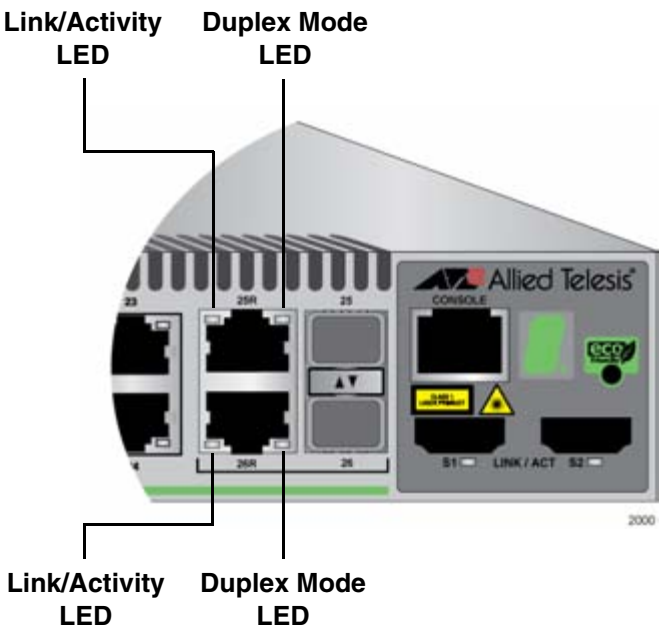


Figure 11. 10/100/1000Base-T Port LEDs

Table 11 describes the LEDs for the 10/100/1000Base-T twisted pair ports.

Table 11. 10/100/1000Base-T Port LEDs

LED	State	Description
Link/Activity	Off	The port has not established a link to an end node.
	Solid green	The port has established a link to an end node.
	Flashing green	The port is receiving or transmitting packets.

Table 11. 10/100/1000Base-T Port LEDs (Continued)

LED	State	Description
Duplex Mode	Off	The port is operating in half-duplex mode.
	Solid green	The port is operating in full-duplex mode.

100Base-FX Port LEDs

Each of the 100Base-FX ports on the AT-8100S/16F8-SC, AT-8100S/16F8-LC, and AT-8100S/24F-LC Switches has a single LED, labeled L/A for Link/Activity.

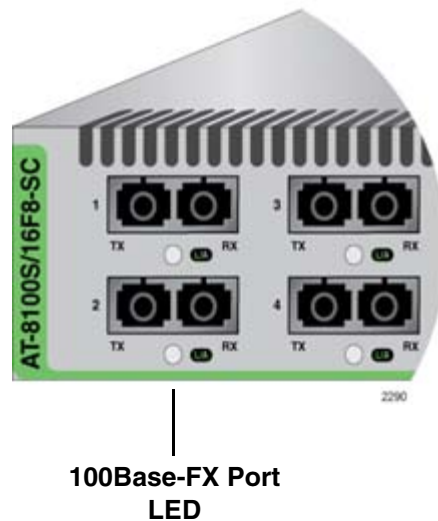


Figure 12. 100Base-FX Port LED

The 100Base-FX port LED is described in Table 12.

Table 12. 100Base-FX Port LED

LED	State	Description
Link/Activity	Off	The port has not established a link to a network device.
	Solid green	The port has established a link to a network device.
	Flashing green	The port is receiving or transmitting packets to a network device.

SFP Slot LED

Each SFP slot has one LED.

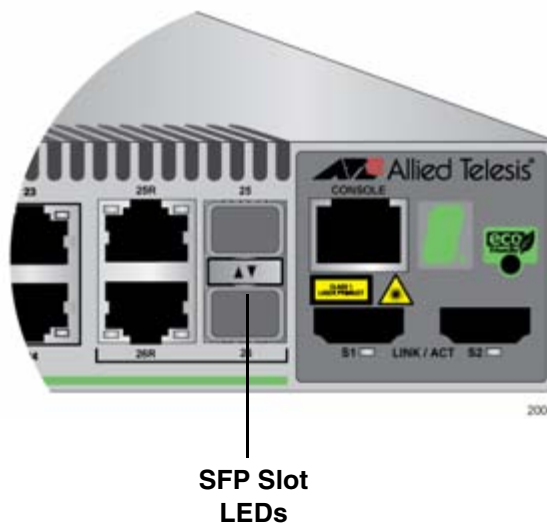


Figure 13. SFP Slot LEDs

The SFP slot LED is described in Table 13.

Table 13. SFP Slot LED

LED	State	Description
Link/Activity	Off	The SFP slot is empty or the SFP module has not established a link to a network device.
	Solid green	The SFP module has established a link to a network device.
	Flashing green	The SFP module is receiving or transmitting packets to a network device.

S1 and S2 Stack Ports LEDs

Each stacking port has one link/activity LED labelled LINK/ACT.

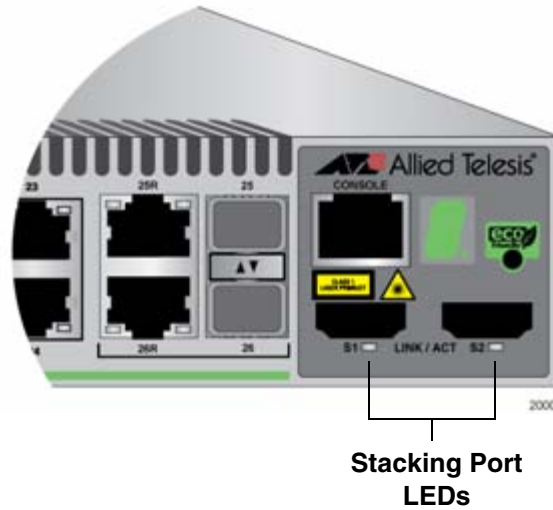


Figure 14. Stacking Port S1 and S2 LEDs

The stacking port LED is described in Table 14.

Table 14. Stacking Port LED

LED	State	Description
LINK/ACT	Off	The stacking port is not connected to another switch or has not established a link.
	Solid green	The stacking port has established a link with a stacking port on another switch.

Note

The stacking port LEDs do not indicate packet activity.

Stack ID LED

The Stack ID LED displays the ID number of the switch. A stand-alone switch should have the ID number 0. Switches connected with the stacking ports to form a virtual stack must have unique numbers. Chapter 5, “Assigning the Stack ID Numbers and Cabling the Stacking Ports” on page 79 has the procedure for verifying and, if necessary, changing the ID number of the switch.

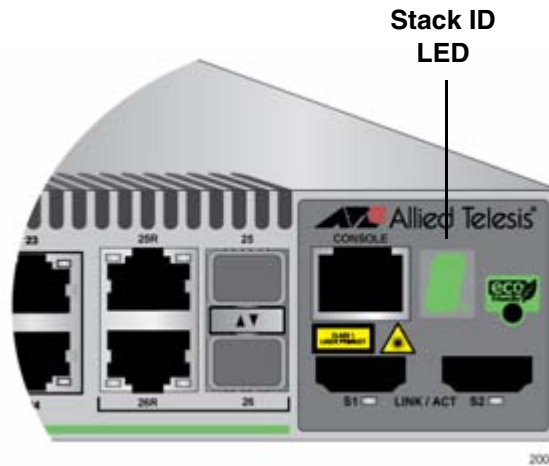


Figure 15. Stack ID LED

Console Port

The Console port is used to configure the features and parameter settings of the switch. This type of management uses serial RS-232 and is commonly referred to as local or out-of-band management because it is not conducted over your network. To perform local management, you must be at the location of the switch and must use the management cable included with the switch.

To establish a local management session with the switch, you connect a terminal or a personal computer with a terminal emulation program to the Console port, which has an RJ-45 style (8P8C) connector, using the provided management cable. The cable which has RJ-45 RJ-style (8P8C) and DB-9 (D-sub 9-pin) connectors.

The Console port is set to the following specifications:

- ☐ Default baud rate: 9600 bps (Range is 9600 to 115200 bps)
- ☐ Data bits: 8
- ☐ Parity: None
- ☐ Stop bits: 1
- ☐ Flow control: None

Note

These settings are for a DEC VT100 or ANSI terminal, or an equivalent terminal emulation program.

Power Supplies

The switches are powered by two internal AC power supplies, except for the AT-8100S/24C Switch, which has one power supply. The supplies are not field-replaceable and each has a separate AC connector on the back panels.

Only one power supply is active at a time in non-PoE switches. The second power supply operates in a redundant state and is automatically activated by the switch if the active power supply loses power or fails. The change over is instantaneous, making it transparent to the network users. Power redundancy is available only when both AC connectors on the switch are connected to power sources.

For all operations excluding PoE, the power supplies in the AT-8100S/24POE Switch operate in the same manner as those in the non-PoE switches. One power supply operates in an active state while the other resides in a redundant state.

For PoE, however, the power supplies operate in a load-sharing manner, with each power supply providing 185 watts, half the total PoE budget of the switch. The maximum 370 watts power budget of PoE is only available when both power supplies are connected to power sources.

Refer to “Technical Specifications” on page 131 for the input voltage range.



Warning

Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord. *See* E3



Warning

This unit might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing the unit. *See* E30

Power Connectors

The 8100S Series switches have two AC or DC power supply sockets on the back panels, except for the AT-8100S/24C Switch, which has just one AC power supply socket.

AC switches are powered on or off by connecting or disconnecting the power cords. DC switches are powered on or off by energizing or de-energizing the DC circuit breakers to which the switches are connected in the wiring closet.

Chapter 2

Stacking Overview

This chapter contains the following sections:

- ❑ “Stacking Guidelines” on page 52
- ❑ “Master Switch” on page 54
- ❑ “Stacking Port Topologies” on page 55
- ❑ “Active Boot Configuration File” on page 57
- ❑ “Initialization Process” on page 59

Stacking Guidelines

A stack is a group 8100S Series switches linked together with the S1 and S2 stacking ports to function as a unified Fast Ethernet switch. They synchronize their actions so that network operations, such as spanning tree protocols, virtual LANs, and static port trunks, span across all of the Fast Ethernet ports.

A stack has two principal advantages over stand-alone units:

- ❑ You can configure all of the switches in a stack from the same management session, rather than individually from different sessions, thereby simplifying network management.
- ❑ You have more latitude when configuring some of the features. For instance, to create a static port trunk on a stand-alone switch you have to choose ports from the same switch. In contrast, a static trunk on a stack can have ports from different switches in the same stack.

Here are the general guidelines for 8100S Series stacks:

- ❑ All 8100S Series switches support stacking.
- ❑ A stack can have up to eight switches or 208 ports.
- ❑ The switches of a stack may be the same model or different models. For instance, a stack can have AT-8100S/24C, AT-8100S/24, and AT-8100S/16F8-SC Switches.
- ❑ Stacking is not supported on the 8100L Series switches.
- ❑ An 8100S Series stack cannot contain other stacking devices, such as the AT-9400Ts Series switches.
- ❑ The 8100S Series switches do not need any additional modules or software for stacking.
- ❑ Each switch must be assigned a unique stack ID number, in the range of 1 to 8, with the STACK command in the Global Configuration mode. It must be assigned before the switch is connected to the stack. The stack will not function properly if there are two or more switches that have the same ID number.
- ❑ The default value for the stack ID number is 0, which is reserved for stand-alone switches.
- ❑ A stack must have one master switch. The master switch is the switch with the lowest stack ID number, usually ID number 1.
- ❑ The master switch can be any switch in the stack.
- ❑ If the master unit fails or is removed from the stack, the member switch with the next lowest ID number takes over as the new master switch.

- ❑ The other units are referred to as member switches.
- ❑ The stacking feature described in this guide is unrelated to the enhanced stacking feature described in the *AT-8100 Series AlliedWare Plus Command Line Interface User's Guide*. They are completely different features.

Master Switch

A stack must have a master switch to coordinate and monitor stack operations. It verifies that the switches are using the same version of management software, that no two switches have the same ID number, and that the stacking ports are cabled correctly.

The selection of the master switch is based on the ID numbers. The master switch is the switch with the lowest ID number of all the switches in the stack. The selection occurs during the discovery process, described in “Initialization Process” on page 59, which the stack performs whenever you power on or reset it. If the master switch is removed from the stack or fails, the member switch with the next lowest ID number automatically becomes the new master switch. If that switch fails or is removed from the stack, then the switch with the next lowest ID number becomes the new master switch, and so on.

Stacking Port Topologies

The switches are connected together with the S1 and S2 ports in the management panels, and the stacking cables that come with the units.

There are two wiring configurations. The first topology is called the duplex-chain topology. This topology connects the switches with a single pathway. A stacking port on one switch is connected to a stacking port in the next switch, which is connected to the next switch, and so on. The connections crossover to different stacking ports on the switches, such that the S1 port in one switch connects to the S2 port in the next switch.



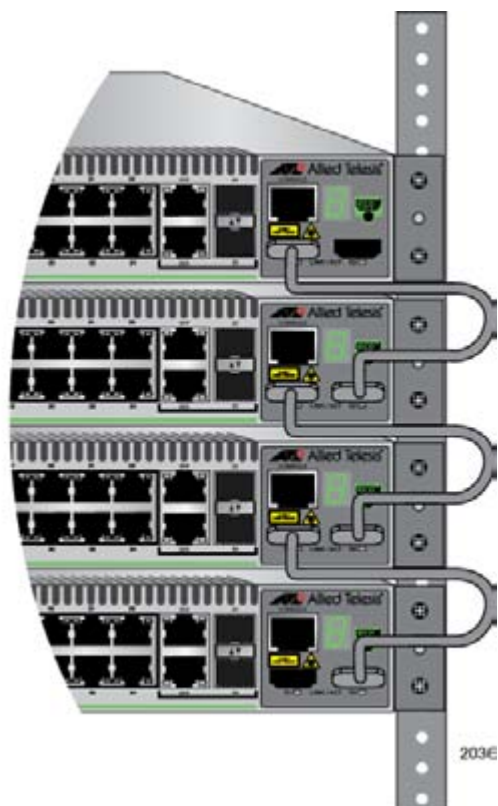
Caution

The stack will not function if the connections to the S1 and S2 stacking ports do not crossover on the switches. If two S1 ports or two S2 ports are connected together, the switches will not form a stack and instead operate as stand-alone devices.

The second topology, the duplex-ring topology, is similar to the duplex-chain, except that the unused stacking ports on the end switches of the stack are connected together to form a physical loop, creating two pathways through the stack. An example of both topologies is shown in Figure 16 on page 56.

Although the topologies are the same in terms of network speed and performance, the duplex-ring topology is the recommended wiring configuration because of the secondary path it provides through the stacking ports. The two pathways protect the switches of the stack against the loss of communications due to a failure of a stacking port, cable, or switch.

Duplex-chain Configuration



Duplex-ring Configuration

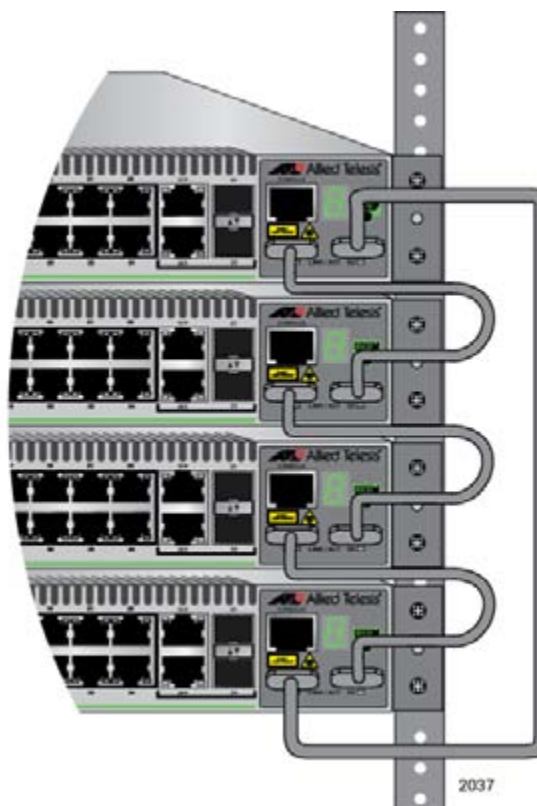


Figure 16 Duplex-chain and Duplex-ring Configurations

Active Boot Configuration File

The master switch stores the settings of the entire stack in a file in its file system. This file is referred to as the active boot configuration file. The switch updates the file with the most recent parameter changes whenever you issue the `WRITE` or `COPY RUNNING-CONFIG STARTUP-CONFIG` command.

The switch comes with two identical boot configuration files, called `BOOT.CFG` and `QSTACK.CFG`. The commands the files contain assign the switch the factory IP address 169.254.1.1 and activate the web browser server so that you may begin to manage the switch with Telnet or a web browser as soon as you set it up.

The `BOOT.CFG` file is the default active file. You may continue to use that file to store the parameter settings of the switch, or you may create another boot configuration file. There are several ways to do that, the easiest being the `BOOT CONFIG-FILE` command, because it both creates the file and designates it as the active boot configuration file.

The name of the active boot configuration file of the stack may be up to 16 alphanumeric characters, plus the `.CFG` extension. For example, you might name the file `STACKBLF2RM4.CFG`.

The `QSTART.CFG` file is identical to the `BOOT.CFG` file. You may use the file to restore the factory settings if you use the `BOOT.CFG` to store the parameter settings of the switch. You would simply copy the `QSTART.CFG` file as the `BOOT.CFG` file.

The master switch periodically sends the active boot configuration file over the stacking ports to the other switches in the stack, which save the file in their respective file systems. The master switch distributes the file so that should it stop functioning or be removed from the stack, any of the other switches can assume the role of master switch. Here are the events that prompt the master switch to distribute the active boot configuration to the member switches:

- ❑ The stack performs the discovery process when it is powered on or reset and when a stacking cable is connected or disconnected. At the completion of the discovery process, the master switch sends its active boot configuration file to the member switches.
- ❑ When you enter the `WRITE` command to save your changes to the parameter settings, to the active boot configuration file. After updating the file, the master switch sends it to the member switches.

The master switch changes the name of the active boot configuration file to `BOOT.CFG` as it sends the file to the other switches during the discovery process or in response to the `WRITE` command. Additionally, it

instructs the other switches to designate that filename as the active boot configuration file so that they use that file if they become the master switch.

Here is an example of how the process works. Let's assume your stack has three switches, assigned the ID numbers 1 to 3. The switch with the ID number 1 is the master switch because it has the lowest ID number of all the switches in the stack. Now assume that you use the `BOOT CONFIG-FILE` to create a new active boot configuration file for the stack and call it `STACKBLF2RM4.CFG`. After configuring some of the stack parameter settings, you issue the `WRITE` command. In response, the master switch updates the `STACKBLF2RM4.CFG` file with your changes and then transmits it, with the new name `BOOT.CFG`, over the stacking ports to the other switches. In turn, they store the file in their file systems and, if they have not already, designate it as their active boot configuration file, so that they use that file should they become the master switch.

Now assume that you remove the master switch from the stack. The switch with the ID number 2 becomes the new master switch because it has the next lowest ID number. The configuration settings of the two remaining switches remain the same, even with the removal of the original master switch, because the new master switch has the same active boot configuration. The file just happens to have a different name. On the original master switch it was called `STACKBLF2RM4.CFG`, but on the new master unit it is `BOOT.CFG`.

So does this mean that you should use `BOOT.CFG` as the filename for the active boot configuration files on your stacks? It does not matter so long as you remember that if you use a different name, the master switch changes it to `BOOT.CFG` when it sends the file to the member switches.

Initialization Process

The switches of the stack synchronize their operations in a five phase process when they are powered on or reset, and prior to forwarding network traffic from their ports.

In the first three phases the switches initialize their management software and features. These phases take a total of approximately 40 seconds.

In the fourth phase, called the discovery process, the switches determine the number of devices in the stack, the cabling topology, and, in the case of the duplex-ring topology, the active path through the stacking ports. It is in this phase that the master switch of the stack is identified. The discovery process takes approximately 80 seconds.

In the fifth phase, the master switch uses its active boot configuration file in its file system to configure the settings of all of the switches in the stack. This phase may take from a few seconds to four minutes, depending on the size of the stack and the number and complexity of the commands in the file.

You can monitor the phases by watching the LEDs, which are defined in Table 16 on page 93, or by attaching a computer with a terminal emulator program to the Console port of the master switch, and watching the initialization messages, shown in Figure 38 on page 94 and Figure 39 on page 95.

The switches of the stack begin forwarding network traffic at the completion of the fifth phase.

Chapter 3

Beginning the Installation

The chapter contains the following sections:

- ❑ “Installation Overview” on page 62
- ❑ “Reviewing Safety Precautions” on page 63
- ❑ “Planning the Installation” on page 67
- ❑ “Unpacking the Switch” on page 69

Installation Overview

Table 15 lists the installation procedures for a stack of 8100S Series switches. The procedures should be performed in the order presented in the table.


Table 15. Installation Procedures

Step	Procedure
1	"Reviewing Safety Precautions" on page 63
2	"Planning the Installation" on page 67
3	"Unpacking the Switch" on page 69
4	"Installing the Switches in an Equipment Rack" on page 72
5	"Labeling the Switches" on page 77
6	"Verifying and Setting the Stack ID Numbers" on page 82
7	"Cabling the Stacking Ports" on page 87
8	"Powering on AC Switches" on page 92 or "Powering On DC Switches" on page 97
9	"Verifying the Installation" on page 101
10	"Cabling the Twisted Pair and Fiber Optic Ports" on page 104
11	"Installing Optional SFP Transceivers" on page 106

Reviewing Safety Precautions


Please review the following safety precautions before you begin to install the switch.

Note

The  indicates that a translation of the safety statement is available in a PDF document titled “Translated Safety Statements” posted on the Allied Telesis website at www.alliedtelesis.com.




Warning

Class 1 Laser product.  L1




Warning

Do not stare into the laser beam.  L2




Warning

Do not look directly at the fiber optic cable ends or inspect the cable ends with an optical lens.  L6




Warning

To prevent electric shock, do not remove the cover. No user-serviceable parts inside. This unit contains hazardous voltages and should only be opened by a trained and qualified technician. To avoid the possibility of electric shock, disconnect electric power to the product before connecting or disconnecting the LAN cables.  E1




Warning

Do not work on equipment or cables during periods of lightning activity.  E2



Warning

Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord.  E3



Warning

Class I Equipment. This equipment must be earthed. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts. ⚡ E4

Note

Pluggable Equipment. The socket outlet shall be installed near the equipment and shall be easily accessible. ⚡ E5



Caution

Air vents must not be blocked and must have free access to the room ambient air for cooling. ⚡ E6



Warning

Operating Temperature. This product is designed for a maximum ambient temperature of 40° degrees C. ⚡ E7

Note

All Countries: Install product in accordance with local and National Electrical Codes. ⚡ E8



Warning

Only trained and qualified personnel are allowed to install or replace this equipment. ⚡ E14




Caution

Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern. ⚡ E21




Caution

Risk of explosion if battery is replaced by an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.


Attention: Le remplacement de la batterie par une batterie de type incorrect peut provoquer un danger d'explosion. La remplacer uniquement par une batterie du même type ou de type équivalent recommandée par le constructeur. Les batteries doivent être éliminées conformément aux instructions du constructeur.  E22



Warning


Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading.  E25

Note


Use dedicated power circuits or power conditioners to supply reliable electrical power to the device.  E27



Warning


This unit might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing the unit.  E30

Note

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (T_{mra}).  E35



Caution

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.  E36



Warning

Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuits (e.g., use of power strips).

⚡ E37



Warning

To reduce the risk of electric shock, the PoE ports on this product must not connect to cabling that is routed outside the building where this device is located. ⚡ E40



Caution

The unit does not contain serviceable components. Please return damaged units for servicing. ⚡ E42



Warning

When you remove an SFP module from this product, the case temperature of the SFP may exceed 40° C (158° F) Exercise caution when handling with unprotected hands. ⚡ E43

Planning the Installation

Observe these requirements when planning the installation of the stack.



Warning

The switches of a stack should only be installed in a standard 19-inch equipment rack. Allied Telesis does not recommend placing switches on top of one another on a table or desktop because that could present a personal safety hazard if you need to move or replace switches.

- ☐ Check that the equipment rack is safely secured and will not tip over. Devices in a rack should be installed starting at the bottom, with the heavier devices near the bottom of the rack.
- ☐ Check that the power outlets for the switches are located near the devices and are easily accessible.
- ☐ Verify that the site provides easy access to the ports on the front of the switches. This will make it easy for you to connect and disconnect cables, as well as view the port LEDs.
- ☐ Check that the site allows for adequate air flow around the units and through the cooling vents on the front and rear panels. (The ventilation direction in units that have a cooling fan is from front to back, with the fan on the back panel drawing the air out of the unit.)
- ☐ Do not place objects on top of the switch.
- ☐ Do not expose the switch to moisture or water.
- ☐ Make sure the site is a dust-free environment.
- ☐ Use dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.
- ☐ Do not install the switch in a wiring or utility box because it will overheat and fail from inadequate airflow.

Choosing the Switches of the Stack

Here are the guidelines for choosing the switches of the stack:

- ☐ The stack can have up to eight 8100S Series switches or 208 ports.
- ☐ The stack can have different 8100S Series switch models.
- ☐ Any 8100S Series switch model can be the master switch of the stack.

To count the ports on the twisted pair models, include the two 10/100/1000Base-T ports along with the 10/100Base-TX ports, but not the SFP slots. For example, a stack of AT-8100S/24 Switches could have up to eight units:

8 switches x 26 ports = 208 ports

To count the ports on the fiber optic models, include the fiber optic, 10/100Base-TX, and 10/100/1000Base-T ports, but not the SFP slots. For example, a stack of AT-8100S/24F-LC Switches could have eight units:

8 switches x 26 ports = 208 ports

Choosing a Site

The switches of a stack should be installed in a standard 19-inch equipment rack and not more than one meter apart, the length of the stacking cable. The end switches cannot be more than one meter apart if you want to create the duplex-ring topology, shown in Figure 17.

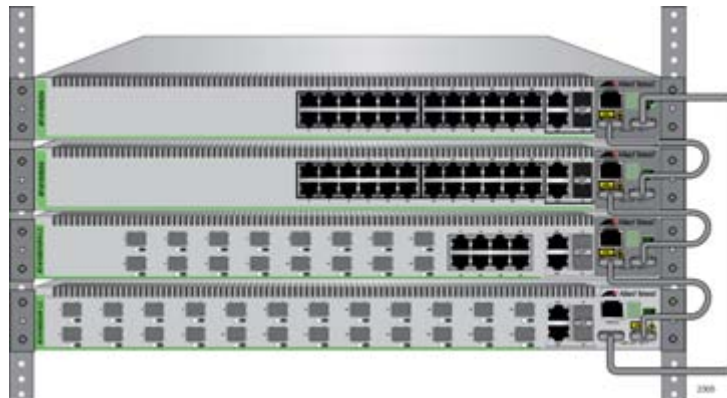


Figure 17. Switches in an Equipment Rack

You may place the switches side-by-side on a table or desktop, as shown in Figure 18. However, you will not be able to create the duplex-ring topology with a stack of three or more switches, because the distance between the end switches will be more than one meter.



Figure 18. Stack on a Table or Desktop

Unpacking the Switch

Refer to the figures in this section to verify the contents of the shipping container of the switch. If any items are missing or damaged, contact your Allied Telesis sales representative for assistance.

8100S Series Switches

The 8100S Series switches, except the AT-8100S/24C Switch, come with the components listed in Figure 19.



One 8100S Series switch



One 2 m (6.6 ft) local management cable with RJ-45 (8P8C) and DB-9 (D-sub 9-pin) connectors.



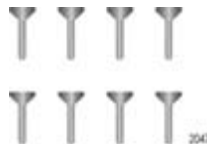
One 1 m (3.3 ft) stacking cable with two type A HDMI connectors.



Two rack mounting brackets



Two regional AC power cords
(Not included with DC powered switches.)



Eight bracket screws

Figure 19. Components of the 8100S Series Switches

AT-8100S/24C Switch

The AT-8100S/24C Switch comes with the items listed in Figure 20.



One AT-8100S/24C Switch



One 2 m (6.6 ft) local management cable with RJ-45 (8P8C) and DB-9 (D-sub 9-pin) connectors.



One 1 m (3.3 ft) stacking cable with two type A HDMI connectors.



One short rack mounting bracket



One long rack mounting bracket



One regional AC power cord



Eight bracket screws

Figure 20. Components of the AT-8100S/24C Switch

Note

You should retain the original packaging material in the event you need to return the unit to Allied Telesis.

Chapter 4

Installing and Labeling the Switches in an Equipment Rack

Here are the procedures in this chapter:

- ❑ “Installing the Switches in an Equipment Rack” on page 72
- ❑ “Labeling the Switches” on page 77

Installing the Switches in an Equipment Rack

This procedure requires the following items:

- ☐ Eight bracket screws (included with the switch)
- ☐ Two equipment rack brackets (included with the switch)
- ☐ Flat-head screwdriver (not provided)
- ☐ Cross-head screwdriver (not provided)
- ☐ Four standard equipment rack screws (not provided)

Perform this procedure to install the switch in a 19-inch equipment rack,



Caution

The chassis may be heavy and awkward to lift. Allied Telesis recommends that you get assistance when mounting the chassis in an equipment rack. *E28*

1. Place the unit upside down on a level, secure surface.



Figure 21. Turning the Switch Upside Down

2. Using a flat-head screwdriver, pry the rubber feet from the bottom of the switch.

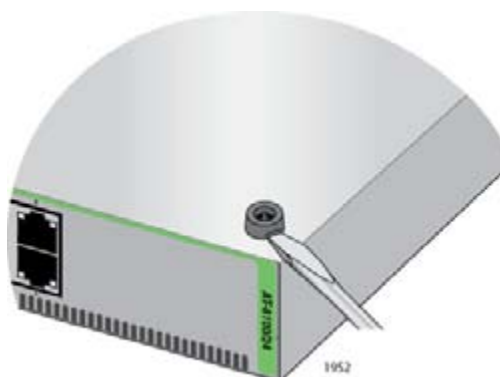


Figure 22. Removing the Rubber Feet

3. Turn the switch over.

4. For all switches except the AT-8100S/24C Switch, secure the two rack mount brackets to the sides of the switch using the eight bracket screws included with the unit. Figure 23 here and Figure 24 on page 74 illustrate the four possible bracket positions.

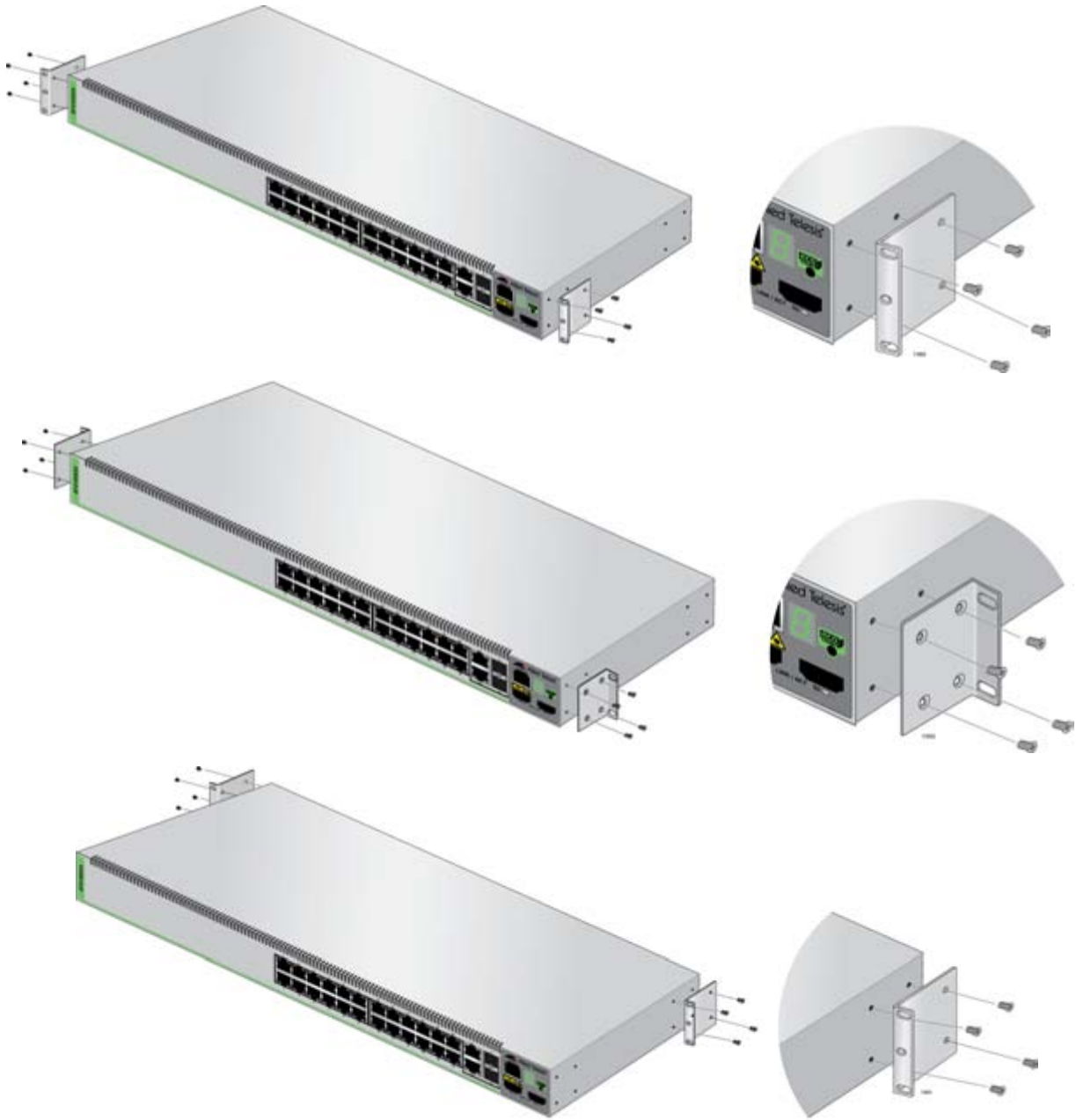


Figure 23. Attaching the Brackets to Install the Switch in an Equipment Rack



Figure 24. Attaching the Brackets to Install the Switch in an Equipment Rack (Continued)

The AT-8100S/24C Switch comes with two short brackets and one long bracket. To install the device in an equipment rack, use one of the short brackets and the long bracket. Allied Telesis recommends installing the short bracket on the right side and the long bracket on the left side, as you face the front of the unit, so that the stacking ports on the unit align with the same ports on other 8100S Series switches in the equipment rack. The possible positions of the brackets are shown in Figure 25 here and Figure 26 on page 75.



Figure 25. Attaching the Brackets to the AT-8100S/24C Switch to Install the Switch in an Equipment Rack

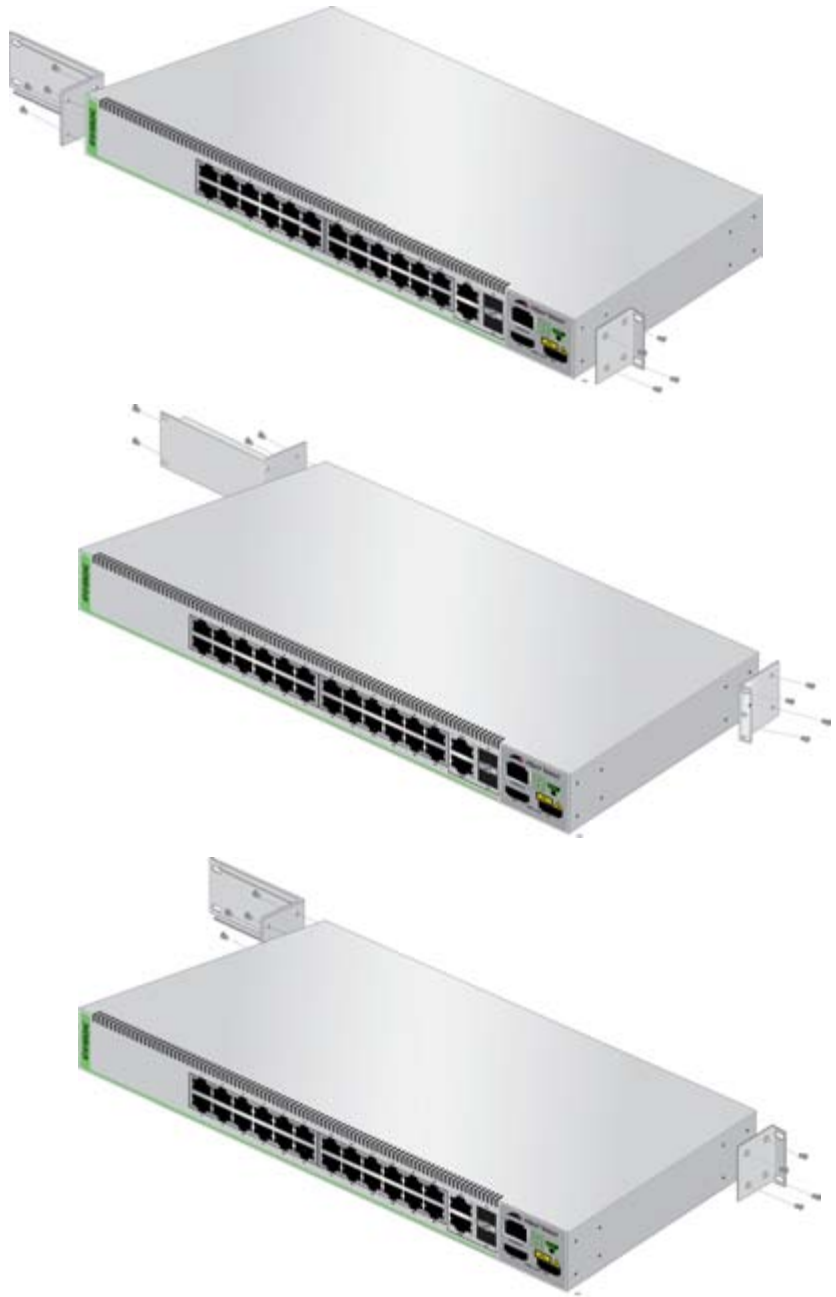


Figure 26. Attaching the Brackets to the AT-8100S/24C Switch to Install the Switch in an Equipment Rack (Continued)

5. Have another person hold the switch in the equipment rack while you secure it using standard screws (not provided).



Figure 27. Mounting the Switch in an Equipment Rack

Repeat this procedure to install all of the switches in the equipment rack. Afterwards, go to “Labeling the Switches” on page 77.

Labeling the Switches

Starting with the top or bottom switch of the stack, assign each unit a number starting with 1 and affix labels with the numbers to their front panels or adjacent to the units on the equipment rack. The numbers will be their stack ID numbers, which you'll assign in Chapter 5, "Assigning the Stack ID Numbers and Cabling the Stacking Ports" on page 79. The number has a range of 1 to 8. An example of a stack with four switches is shown in Figure 28. Please review the following before numbering the switches:

- ❑ The labels should also include the MAC addresses of the switches, which are found on the labels on the back panels. Including the MAC addresses on the labels makes it easier to verify the composition of the stack.
- ❑ Although the switches can be numbered in any order, numbering them in sequence starting with the top or bottom switch makes it easier to identify and manage them.
- ❑ The switch assigned stack ID number 1 is the master switch of the stack. In a stack with different models of 8100S Series switches, the master switch can be any model.

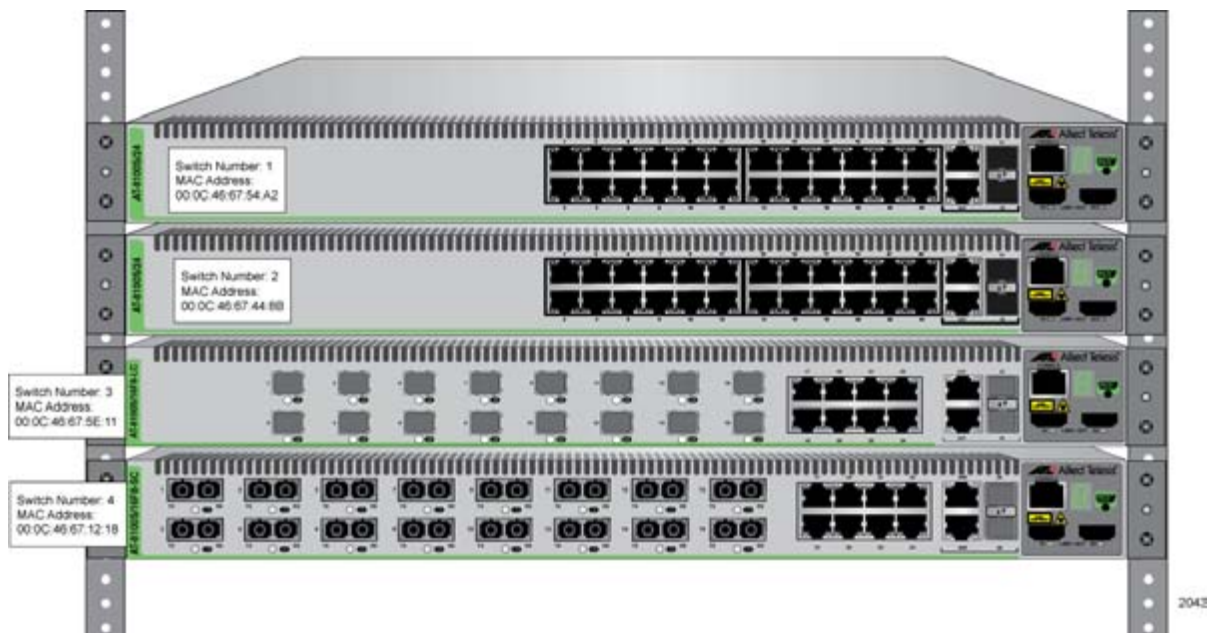


Figure 28. Labelling the Switches

After labeling the units, go to Chapter 5, "Assigning the Stack ID Numbers and Cabling the Stacking Ports" on page 79.

Chapter 5

Assigning the Stack ID Numbers and Cabling the Stacking Ports

The procedures in this chapter explain how to configure the stack ID numbers on the switches and cable the S1 and S2 stacking ports:

- ❑ “Powering on a Switch” on page 80
- ❑ “Verifying and Setting the Stack ID Numbers” on page 82
- ❑ “Cabling the Stacking Ports” on page 87

You must assign the stack ID numbers before cabling the S1 and S2 stacking ports.

Powering on a Switch

Power on one of the switches in the stack with these instructions.

1. Plug the power cord into the AC power connector on the back panel of the unit (see Figure 29).

Note

If you are installing a DC powered switch, refer to “Powering On DC Switches” on page 97.



Warning

Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord. ⚡ E3



Warning

This unit might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing the unit. ⚡ E30

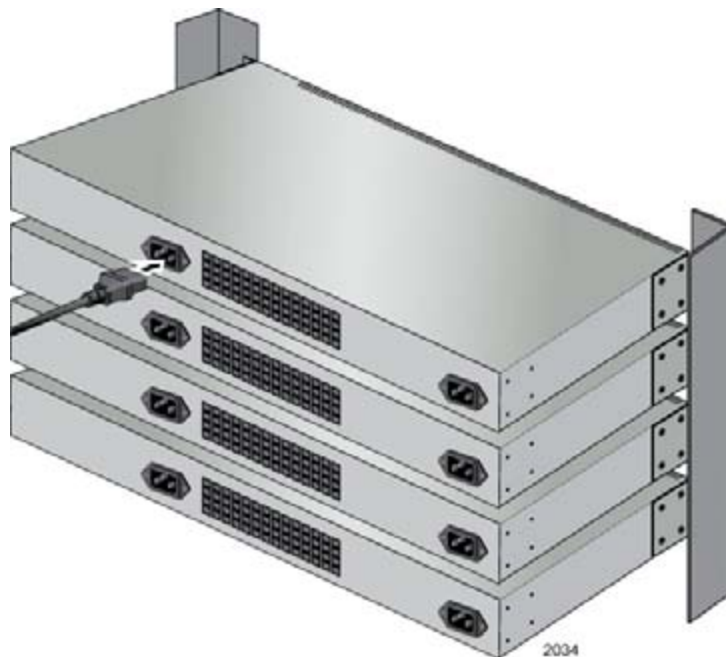


Figure 29. Connecting the AC Power Cord

2. Connect the other end of the power cord to an appropriate AC power outlet. For power specifications for the switch, refer to “Power Specifications” on page 132.
3. Wait one minute for the switch to initialize its management software and then go to “Verifying and Setting the Stack ID Numbers” on page 82. For instructions on how to monitor the initialization processes, refer to “Monitoring the Initialization Processes” on page 93.

Verifying and Setting the Stack ID Numbers

After the switch has initialized its management software, examine the number displayed on the Stack ID LED to see if it matches the number you want it to have in the stack. (This is the number you wrote on the switch's label in "Labeling the Switches" on page 77.) Do one of the following:

- ❑ If the switch's current ID number displayed on the Stack ID LED is different from the intended ID number for the unit, perform the following procedures to change it.
- ❑ If the switch's current ID number is the same as the intended ID number for the unit, you do not need to set it because it is already set correctly. Power off the switch and perform the procedure "Powering on a Switch" on page 80 on the next switch in the stack. If you have verified and set the ID numbers on all of the switches, go to "Cabling the Stacking Ports" on page 87.

You may set the stack ID number on the switch from a local management session using the Console port or, because the switch has a factory IP address, from a Telnet management session from any of the unit's networking ports. If you prefer to use the Console port, go to "Starting a Local Management Session," next. To use the Telnet application protocol, go to "Starting a Telnet Management Session" on page 83. (You cannot use the web browser management interface to change the switch's stack ID number.)



Caution

Setting the stack ID number resets the switch. Some network traffic may be lost if the device is connected to a live network.

Starting a Local Management Session

This procedure requires a terminal or a terminal emulator program and the management cable that comes with the switch. To start a local management session on the switch:

1. Connect the RJ-45 end of the management cable included with the 8100S Switch to the Console port on the front panel of the switch, as shown in Figure 30 on page 83.

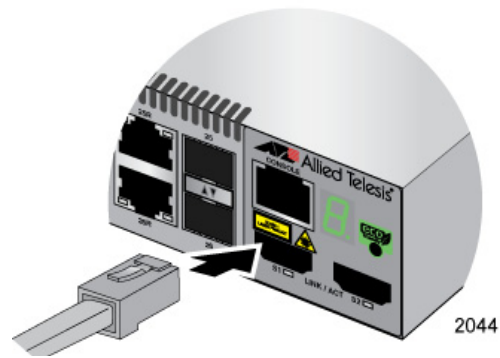


Figure 30. Connecting the Management Cable to the RJ-45 Terminal Port on the Switch

2. Connect the other end of the cable to an RS-232 port on a terminal or a personal computer with a terminal emulation program.
3. Configure the terminal or terminal emulation program as follows:
 - ☐ Baud rate: Default is 9600 bps (Range is 9600 to 115200 bps)
 - ☐ Data bits: 8
 - ☐ Parity: None
 - ☐ Stop bits: 1
 - ☐ Flow control: None

Note

The port settings are for a DEC VT100 or ANSI terminal, or an equivalent terminal emulator program.

4. Press Enter.
5. When prompted for a user name, go to “Changing the Stack ID Number” on page 85.

Starting a Telnet Management Session

Setting the stack ID number from a Telnet management session requires Telnet client software on your computer. This procedure assumes that you will be connecting your computer to a twisted pair port on the switch. To start a Telnet management session on the switch using the factory IP address:

1. Assign your management workstation the IP address 169.254.*n.n*, with the subnet mask 255.255.0.0. The variable *n* can be from 1 to 255. You may not use the switch’s IP address 169.254.1.1. Refer to your computer’s documentation for instructions on how to set the IP address.

Note

Your computer automatically defaults to an 169.254.*n.n* address if it is running a DHCP client and does not receive a response from a DHCP server. To have a DHCP client assign the address, disconnect your computer from your network, power it on, wait for the DHCP client to generate the IP address 169.254.*n.n*, and then connect the computer to your new 8100S Series switch.

2. Connect a straight-through twisted pair cable to one of the networking ports on the switch. You may connect the cable to any of the ports, except the Console port, which is not a networking port.

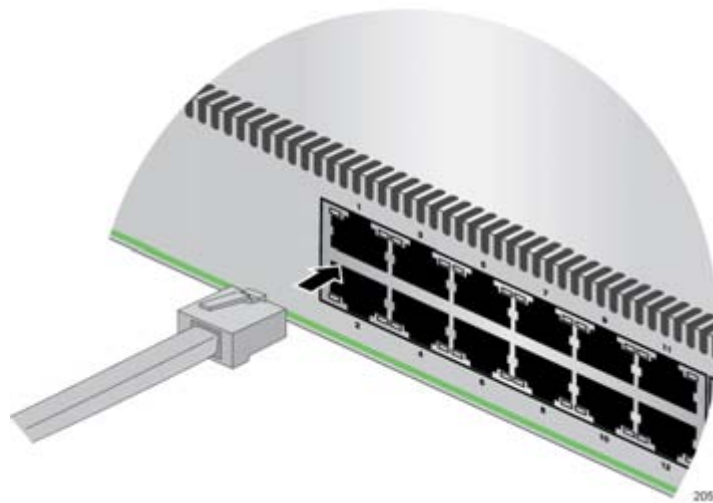


Figure 31. Connecting the Twisted Pair Cable to a Networking Port on the Switch

Note

The switch does not come with twisted pair cables.

3. Connect the other end of the cable to the Ethernet port on your computer.
4. Start the Telnet client on your computer and specify the switch's IP address, 169.254.1.1.
5. When prompted for a user name, go to "Changing the Stack ID Number" on page 85.

Changing the Stack ID Number

To set the stack ID number:

1. When prompted, enter a user name and password to log on the switch. If this is the initial management session of the switch, enter “manager” as the user name “friend” as the password. The user name and password are case sensitive.

The local management session has started when the AlliedWare Plus™ command line prompt, shown in Figure 32 is displayed.

```
awplus>
```

Figure 32. AlliedWare Plus Command Line Prompt

2. Enter the ENABLE and CONFIGURE TERMINAL commands to move to the Global Configuration mode.

```
awplus> enable
awplus# configure terminal
awplus(config)#
```

3. To set the switch's ID number, use the STACK command, in this format:

```
stack old_id renumber new_id
```

The OLD_ID parameter is the switch's current ID number, displayed on the stack ID LED. The NEW_ID parameter will be the switch's new ID number, found on the label that you added to the switch in “Labeling the Switches” on page 77. In this example of the command, the switch's current ID number is 0 and its new number is 1:

```
awplus(config)# stack 0 renumber 1
```

This confirmation prompt is displayed.

```
*** Warning Stack renumbering requires immediate reboot ***
Stack will restart with new Device ID, all ports will
have new numbering and any port configurations will
probably be lost.
Renumber and reboot system ? (y/n):
```

Figure 33. STACK Command Confirmation Prompt



Caution

The STACK command resets the switch. Some network traffic may be lost if the switch is already connected to a live network.

4. Type Y to change the switch's ID number and reset the unit, or N to cancel the procedure.
5. Wait for the switch to initialize its management software and afterwards examine the Stack ID LED again to confirm that it's displaying the correct stack ID number for the switch. For example, if in step 3 you assigned the switch the ID number 2, then the stack ID LED should be displaying the number 2.
6. Disconnect the AC power cord from the switch and the power source.
7. Return to "Powering on a Switch" on page 80 to verify and set the stack ID number of the next switch in the stack. If there are no further switches, go to "Cabling the Stacking Ports" on page 87.

Cabling the Stacking Ports

Now that you've assigned and verified the stack ID numbers of the switches, you may connect the stacking cables to the S1 and S2 stacking ports on the front panels of the units. A stacking cable must crossover to different stacking ports on two switches, such that it connects the S1 port on one switch to the S2 port on another switch.

Note

All the switches should be powered off.

1. Starting with the top switch, connect one end of a stacking cable to either the S1 or S2 port.
2. Connect the other end of the same cable to one of the stacking ports on the second switch, being sure that the cable crosses over to a different port. In the example shown in Figure 34, port S1 on the first switch is connected to port S2 on the second switch.



Caution

Do not connect two S1 or S2 ports together.



Figure 34. Connecting the Stacking Cable

3. If the stack has more than two switches, repeat this with the remaining devices, being sure that the two connectors on a stacking cable connect to different stacking ports.

An example of a stack of four switches is shown in this figure.

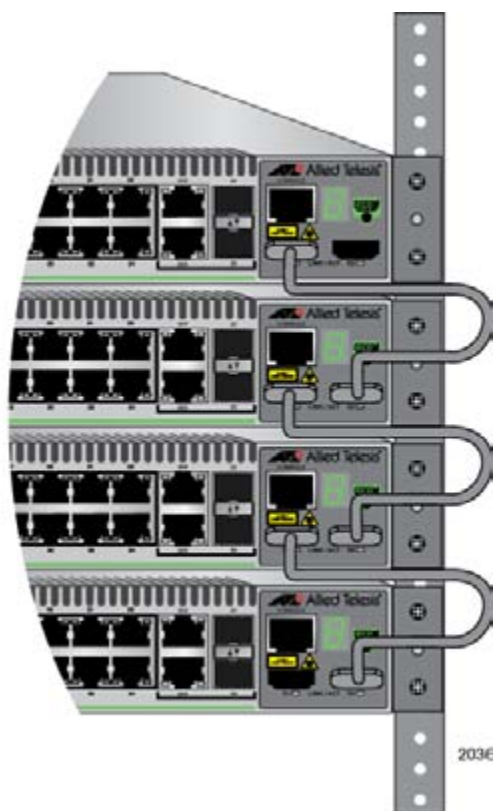


Figure 35. Example Stack of Four Switches

4. To add a redundant path to the stack, connect a stacking cable to the empty stacking ports on the top and bottom switches.

An example of a stack with a redundant path is shown in Figure 36.

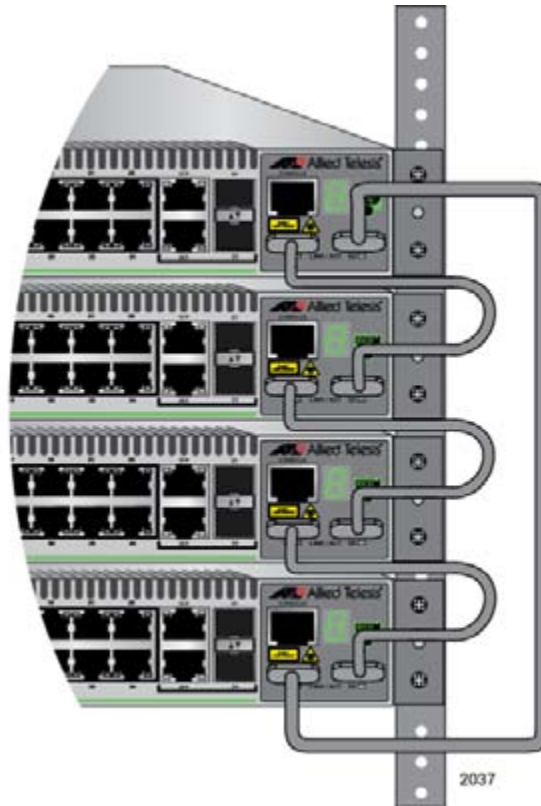


Figure 36. Example Stack of Four Switches with a Redundant Path

5. Go to Chapter 6, “Powering On and Verifying the Stack” on page 91.

Chapter 6

Powering On and Verifying the Stack

The procedures in this chapter are listed here:

- ❑ “Powering on AC Switches” on page 92
- ❑ “Powering On DC Switches” on page 97
- ❑ “Verifying the Installation” on page 101

Powering on AC Switches

To power on the stack for the first time, connect the power cords to the connectors on the back panels and to the appropriate power sources. All of the models have two power supplies with separate connectors. The only exception is the AT-8100S/24C Switch, which has only one power supply.

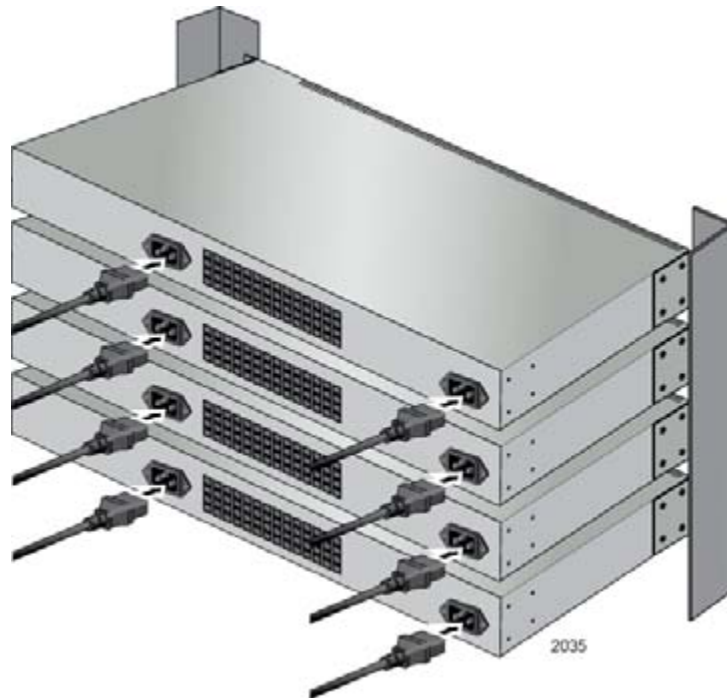


Figure 37. Plugging in the AC Power Cords

Consider the following items as you power on the stack:

- ❑ You should power on the member switches first, wait a few seconds, and then power on the master switch. The master switch is the unit with the lowest stack ID number.
- ❑ You can protect a switch from a power circuit failure by connecting its two power cords to power sources that are on different circuits.
- ❑ The AT-8100S/24POE Switch supports 370 watts of PoE only when both internal power supplies are connected to power sources. The switch has a PoE budget of 185 watts if only one power supply is functional. For background information, refer to “Power Supplies” on page 48.
- ❑ For the power specifications, refer to “Power Specifications” on page 132.

**Warning**

Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord. ⚡ E3

Note

Pluggable Equipment. The socket outlet shall be installed near the equipment and shall be easily accessible. ⚡ E5

Monitoring the Initialization Processes

It takes a minimum of three minutes for the switches of the stack to initialize their management software programs and features, perform the discovery process, and load the configuration file. You may monitor the processes by watching the LEDs on the front panel. Table 16 provides the various phases of the entire initialization process and the approximate time intervals the phases require. The time length of phase 5, loading the configuration file, varies from a few seconds to four minutes, depending on the number and complexity of the commands in the file. The Stack ID LED acts differently depending on whether the unit is powered on or reset with the RELOAD or RESET command.

Table 16. LEDs and Management Software Initialization

LEDs	Initialize Management Software		Initialize Features	Discovery Process	Load Configuration File
	Phase 1: 15 seconds	Phase 2: 15 seconds	Phase 3: 10 seconds	Phase 4: 80 seconds	Phase 5: varies
Base port LEDs	On	On	Off	Off	Off
10/100/1000Base-T port and SFP slot LEDs	On	Off	Off	Off	Off
Stack ID LED					
Power cycle	Off	Off	Flashing	On	On
RELOAD or RESET command	On	On	Flashing	On	On

The base port LEDs are on in phases 1 and 2 if they are connected to live network devices. Otherwise, they are off. The 10/100/1000Base-T port and SFP LEDs are on in phase 1 regardless of whether they are connected to live network devices.

You may also monitor the processes by connecting a terminal or computer with has a terminal emulator program to the Console port on the master switch. The messages in Figure 38 here, Figure 39 on page 95, and Figure 40 on page 96 are displayed during the initialization process.

```
CFE-NTSW-5.0.0 for BCM956218 (32bit,SP,BE,MIPS)
Build Date: wed Jul 23 13:47:51 PDT 2008 (jwong@tiramisu)
Copyright (C) 2000, 2001, 2002, 2003, 2004, 2005 Broadcom Corporation.

Initializing Arena.
Initializing Devices.
Board : BCM956218K48
CPU type 0x2901A: 266MHz
Total memory: 0x8000000 bytes (128MB)
Total memory used by CFE: 0x87EBB000 - 0x87FFF6C0 (1328832)
Initialized Data: 0x87EFA224 - 0x87EFC4F0 (8908)
BSS Area: 0x87EFC4F0 - 0x87EFD6C0 (4560)
Local Heap: 0x87EFD6C0 - 0x87FFD6C0 (1048576)
Stack Area: 0x87FFD6C0 - 0x87FFF6C0 (8192)
Text (code) segment: 0x87EBB000 - 0x87EF9AE3 (256739)
Boot area (physical): 0x07E7A000 - 0x07EBA000
Relocation Factor: I:E82BB000 - D:E82BB000
Loader:elf Filesys:raw Dev:flash0.os-Linux File:ATI Options:(null)
Loading: 0x80001000/2341892 0x8023e000/12135086 0x80dd0aae/185714 Entry
at 0x8026c000
Starting program at 0x8026c000

/usr/bin:/bin:/usr/sbin:/sbin
Starting SNMP...
Starting MainTask...

Initializing System ..... done!
Initializing Board ..... done!
Initializing Serial Interface ..... done!
Initializing Timer Library ..... done!
Initializing IPC ..... done!
Initializing Event Log ..... done!
Initializing Switch Models ..... done!
Initializing File System ..... done!
Initializing Database ..... done!
Initializing Configuration ..... done!
Initializing AW+ CLI ..... done!
Initializing Drivers ..... done!
Initializing Port ..... done!
Initializing Trunk ..... done!
Initializing Port Security ..... done!
Initializing LACP ..... done!
Initializing PORT VLAN ..... done!
Initializing Port Mirroring ..... done!
```

Figure 38. Switch Initialization Messages

```

Initializing Port Statistics ..... done!
Initializing Snmp Service ..... done!
Initializing Web Service ..... done!
Initializing Monitor ..... done!
Initializing STP ..... done!
Initializing SPANNING TREE ..... done!
Initializing L2_MGMT ..... done!
Initializing LLDP_RX ..... done!
Initializing LLDP_TX ..... done!
Initializing GARP ..... done!
Initializing GARP Post Init Task ..... done!
Initializing IGMPsnoop ..... done!
Initializing SYS_MGMT ..... done!
Initializing SWITCH_MGMT ..... done!
Initializing L2APP_MGMT ..... done!
Initializing SNMP_MGMT ..... done!
Initializing Authentication ..... done!
Initializing TCPIP ..... done!
Initializing Default VLAN ..... done!
Initializing ENCO ..... done!
Initializing PKI ..... done!
Initializing PortAccess ..... done!
Initializing PAACctRcv ..... done!
Initializing SSH ..... done!
Initializing IFM ..... done!
Initializing IFMV6 ..... done!
Initializing RTM ..... done!
Initializing FTAB ..... done!
Initializing FTABV6 ..... done!
Initializing ACM ..... done!
Initializing Filter ..... done!
Initializing L3_MGMT ..... done!
Initializing L3APP_MGMT ..... done!
Initializing SFLOW ..... done!
Initializing NTP ..... done!
Initializing CPU_HIST ..... done!
Initializing EStacking ..... done!
Initializing MGMT_MGMT ..... done!
Initializing PSTACK ..... done!
Please wait while stack is being detected ..... done!
Stack is Active, beginning initialization ... Please wait ...
Starting Master election, please wait...

Master election is done! Switch 1 (00:00:54:55:56:01) is the master.

```

Figure 39. Switch Initialization Messages (Continued)

```
Stack topology discovery is in process... Please wait
Loading configuration file "boot.cfg" .... done!
Sending Configuration file to all slaves. Please wait...
00000001
Sending configuration file done!

Press <ENTER> key to connect...
New Switch 2 (00:15:77:99:99:91) is added into stack
```

Figure 40. Switch Initialization Messages (Continued)

At this point, the stack is operational and ready to forward network traffic. Before connecting the network cables, go to “Verifying the Installation” on page 101.

Note

After the stack becomes operational, the stack ID LEDs on the master and member switches flash the ID numbers and code letter “H” every few seconds. This is normal for the LEDs when the switches are operating in a stack configuration.

Powering On DC Switches

Perform this procedure to power on a stack of DC 8100S Series switches:



Warning

As a safety precaution, install a circuit breaker with a minimum value of 15 Amps between the equipment and the DC power source.

Always connect the wires to the LAN equipment first before you connect the wires to the circuit breaker. Do not work with HOT feeds to avoid the danger of physical injury from electrical shock. Always be sure that the circuit breaker is in the OFF position before connecting the wires to the breaker. *See* E9



Warning

For centralized DC power connection, install only in a restricted access area. *See* E23

Note

A tray cable is required to connect the power source if the unit is powered by centralized DC power. The tray cable must be a UL listed Type TC tray cable and rated at 600 V and 90 degrees C, with three conductors, minimum 14 AWG. *See* E24

Note

The AT-8100S/24 Switch is currently the only model with a DC power supply option. For details on the availability of other DC models, contact your Allied Telesis representative.

1. Power off the DC circuit to which the switch will be connected.
2. Use the legend below the terminal block to identify the terminals. The terminals are **positive**, **power supply ground**, and **negative**, from left to right, as shown in Figure 41 on page 98.

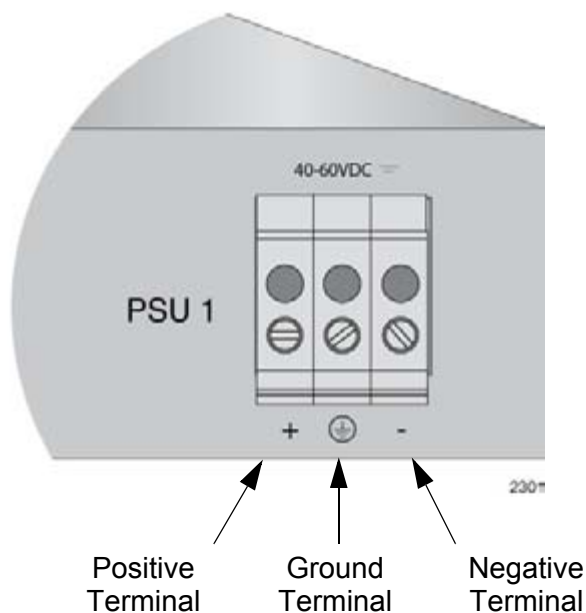


Figure 41. DC Terminal Block

3. With a 14-gauge wire-stripping tool, strip the three wires in the tray cable coming from the DC input power source to $8\text{mm} \pm 1\text{mm}$ ($0.31\text{ in.} \pm 0.039\text{ in.}$), as shown in Figure 42 on page 98.



Warning

Do not strip more than the recommended amount of wire. Stripping more than the recommended amount can create a safety hazard by leaving exposed wire on the terminal block after installation. E10

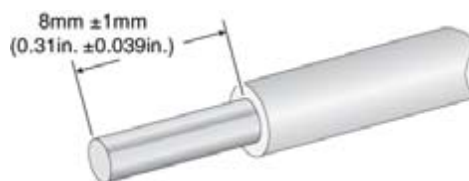


Figure 42. Stripped Wire

4. Insert the power supply ground wire into the middle connector of the DC terminal and tighten the connection with a flathead screwdriver, as shown in Figure 43 on page 99.



Warning

When installing this equipment, always ensure that the power supply ground connection is installed first and disconnected last. E11

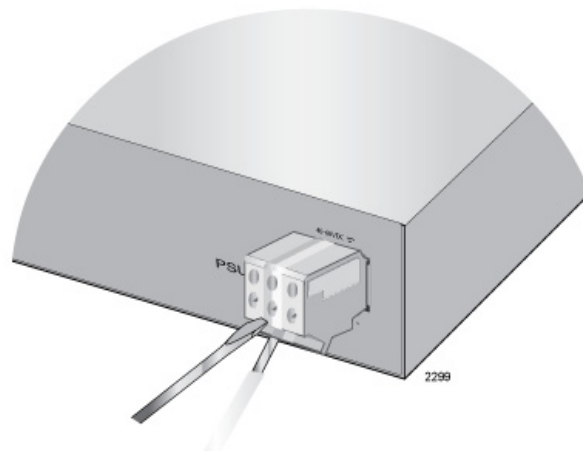


Figure 43. Inserting Wires into the DC Terminal Block

5. Connect the positive feed wire to the terminal block marked + (plus).
6. Connect the negative feed wire to the terminal block marked - (minus).



Warning

Check to see if there are any exposed copper strands coming from the installed wires. When this installation is done correctly there should be no exposed copper wire strands extending from the terminal block. Any exposed wiring can conduct harmful levels of electricity to persons touching the wires. *E12*

7. Secure the tray cable near the rack framework using multiple cable ties to minimize the chance of the connections being disturbed by casual contact with the wiring. Use at least four cable ties, separated four inches apart. Locate the first one within six inches of the terminal block.

Note

This system will work with a positive grounded or negative grounded DC system. *E13*

8. Verify that the circuit breaker is in the OFF position.
9. Connect the supply-cable wires to the circuit breaker.
10. Energize the circuit breaker.

It takes the switches of a stack a minimum of two minutes to initialize their management software and activate the default settings. For instructions on how to monitor the processes, refer to “Monitoring the Initialization Processes” on page 93.

11. Repeat this procedure to power on the second power supply.



Warning

This unit might have more than one power source. To reduce the risk of electric shock, disconnect all power cords before servicing the unit. *See* E30

12. Repeat this procedure to power on the other switches in the stack.

At this point, the stack is operational and ready to forward network traffic. Before connecting the network cables, go to the next procedure, “Verifying the Installation” on page 101.

Verifying the Installation

To verify the installation of the stack, perform the following procedure:

1. Establish a local or Telnet management session on the master switch of the stack. For instructions, refer to “Starting a Local Management Session” on page 82 or “Starting a Telnet Management Session” on page 83. If you are establishing a local management session, you must use the Console port on the master switch, which has the lowest ID number of all the switches in the stack.
2. Move to the Privileged Exec mode with the ENABLE command and then enter the SHOW STACK command:

```
awplus> enable
awplus# show stack
```

The command lists the switches in the stack. An example is shown in Figure 44.

Stack Info:			
Number of Modules:	4		
Topology:	Chain		
Local Module ID:	1		
Local MAC Address:	00:00:54:55:56:18		
Master Module ID:	1		
Master MAC Address:	00:00:54:55:56:18		

DeviceID	MACADDRESS	SwVer	Model

1	00:00:54:55:56:18	2.2.2	AT-8100S/24
2	00:00:54:55:56:c4	2.2.2	AT-8100S/24POE
3	00:00:54:55:56:30	2.2.2	AT-8100S/24C
4	00:00:54:55:56:92	2.2.2	AT-8100S/24POE

Figure 44. SHOW STACK Command

3. Match the entries in the table with the switches in the equipment rack by referring to the labels on the front panels of the units. The ID number and MAC address on a switch's label should match the unit's entry in the table. For example, the switch labeled 2 and assigned the stack ID number 2 should correspond to DeviceID 2 in the table.

If there is a mismatch or if the window is not displaying all of the switches, you may have connected the stacking cables incorrectly or assigned the wrong stack ID number to a switch. To correct the problem, try the following:

- ❑ Verify that the S1 and S2 ports are properly cabled. The stacking cables must crossover to different ports on the switches. For instructions, refer to “Cabling the Stacking Ports” on page 87.

- ❑ Examine the stack ID LEDs to verify that each switch has been assigned a unique ID number, in the range of 1 to 8. If there are switches with duplicate numbers, power off the stack and perform the procedures in Chapter 5, “Assigning the Stack ID Numbers and Cabling the Stacking Ports” on page 79. (The stack ID number must be set while the switch is functioning as a stand-alone unit.)

The stack is operating correctly when the physical switches correspond correctly with the information the `SHOW STACK` command displays.

4. To continue with the installation, go to Chapter 7, “Cabling the Network Ports” on page 103.

Chapter 7

Cabling the Network Ports

This chapter contains the following procedures:

- ❑ “Cabling the Twisted Pair and Fiber Optic Ports” on page 104
- ❑ “Installing Optional SFP Transceivers” on page 106
- ❑ “Managing the Stack” on page 110

Cabling the Twisted Pair and Fiber Optic Ports

This section contains the guidelines to cabling the twisted pair and fiber optic ports.

Twisted Pair Ports

Here are the guidelines to cabling the 10/100Base-TX and 10/100/1000Base-T twisted pair ports:

- ❑ The cable specifications for the 10/100Base-TX and 10/100/1000Base-T twisted pair ports are listed in Table 6 on page 31 and Table 7 on page 33, respectively.
- ❑ The connectors on the cables should fit snugly into the ports, and the tabs should lock the connectors into place.
- ❑ The default setting for the wiring configurations of the ports is auto-MDI/MDI-X. The default setting is appropriate for switch ports that are connected to 10/100Base-TX network devices that also support auto-MDI/MDI-X.
- ❑ The default auto-MDI/MDI-X setting is not appropriate for switch ports that are connected to 10/100Base-TX network devices that do not support auto-MDI/MDI-X and have a fixed wiring configuration. For switch ports connected to those types of network devices, you should disable auto-MDI/MDI-X and set the wiring configurations manually.
- ❑ The appropriate MDI/MDI-X setting for a switch port connected to a 10/100Base-TX network device with a fixed wiring configuration depends on the setting of the network device and whether the switch and network device are connected with straight-through or crossover cable. If you are using straight-through twisted pair cable, the wiring configurations of a port on the switch and a port on a network device must be opposite each other, such that one port uses MDI and the other MDI-X. For example, if a network device has a fixed wiring configuration of MDI, you must disable auto-MDI/MDI-X on the corresponding switch port and manually set it to MDI-X. If you are using crossover twisted pair cable, the wiring configurations of a port on the switch and a port on a network device must be the same.
- ❑ The default speed setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation.
- ❑ The default speed setting of Auto-Negotiation is not appropriate for ports connected to 10/100Base-TX network devices that do not support Auto-Negotiation and have fixed speeds. For those switch ports, you should disable Auto-Negotiation and set the port's speed manually to match the speeds of the network devices.

- ❑ The 10/100/1000Base-T ports must be set to Auto-Negotiation, the default setting, to operate at 1000Mbps.
- ❑ The default duplex mode setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation for duplex modes.
- ❑ The default duplex mode setting of Auto-Negotiation is not appropriate for ports connected to network devices that do not support Auto-Negotiation and have a fixed duplex mode. You should disable Auto-Negotiation on those ports and set their duplex modes manually to avoid the possibility of duplex mode mismatches. A switch port using Auto-Negotiation defaults to half-duplex if it detects that the end node is not using Auto-Negotiation, which can result in a mismatch if the end node is operating at a fixed duplex mode of full-duplex.

Fiber Optic Ports

Here are the guidelines to cabling the 100Base-FX fiber optic ports on the AT-8100S/16F8-SC and AT-8100S/16F8-LC Switches:

- ❑ The cable specifications for the 100Base-FX fiber optic ports are listed in Table 3 on page 25.
- ❑ Do not remove the dust covers from the fiber optic ports until you are ready to connect the fiber optic cables. Dust contamination can adversely affect the operations of the ports.
- ❑ The connectors on the cables should fit snugly into the ports, and the tabs should lock the connectors into place.

General Guidelines

These guidelines apply to both the twisted pair and fiber optic ports:

- ❑ You should not connect the cables to ports of static or LACP port trunks until after you have created the trunks using the switch's management software. Connecting the cables before creating the trunks will result in network loops, which can adversely affect network performance.
- ❑ If your network topology contains a loop where two or more network devices can communicate with each other over more than one network path, do not connect the network cables that form the loop until after you activate one of the spanning tree protocols on the stack. Data loops can adversely affect network performance. For background information on the spanning tree protocols, refer to the *AT-8100 Series AlliedWare Plus Command Line Interface User's Guide*.

Installing Optional SFP Transceivers

Review the following guidelines before installing optional SFP transceivers in the switch:

- ❑ The SFP slots are part of combo ports, with 10/100/1000Base-T ports. For operational information, refer to “SFP Slots” on page 34.
- ❑ SFP transceivers can be hot-swapped while the switch is powered on. However, you should always disconnect the fiber optic cables first before removing a transceiver.
- ❑ You should install the transceiver before connecting the fiber optic cable.
- ❑ Fiber optic transceivers are dust sensitive. Always keep the plug in the optical bores when a fiber optic cable is not installed, or when you store the transceiver. When you do remove the plug, keep it for future use.
- ❑ Unnecessary removal and insertion of a transceiver can lead to premature failure.



Warning

A transceiver can be damaged by static electricity. Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the device.

Note

The cable specifications of optional SFP transceivers are found in the installation guides that ship with the devices.

To install an SFP transceiver:

1. Remove the dust plug from a transceiver slot on the switch. Refer to Figure 45 on page 107.



Figure 45. Removing the Dust Plug from an SFP Slot

2. Remove the transceiver from its shipping container and store the packaging material in a safe location.
3. If you are installing the transceiver in the top SFP slot, position the transceiver with the Allied Telesis label facing up. If you are installing the transceiver in the bottom slot, position the transceiver with the label facing down.
4. Slide the transceiver into the slot until it clicks into place.



Figure 46. Installing an SFP Transceiver

5. Remove the dust cover from the module, as shown in Figure 47 on page 108.



Figure 47. Removing the Dust Cover from the SFP Module

6. Verify that the handle on the SFP transceiver is in the upright position, as shown in Figure 48.

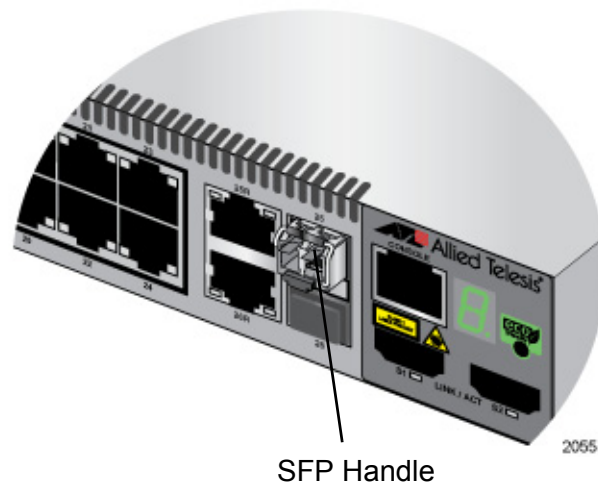


Figure 48. Positioning the SFP Handle in the Upright Position

7. Connect the fiber optic cable to the SFP module, as shown in Figure 49.

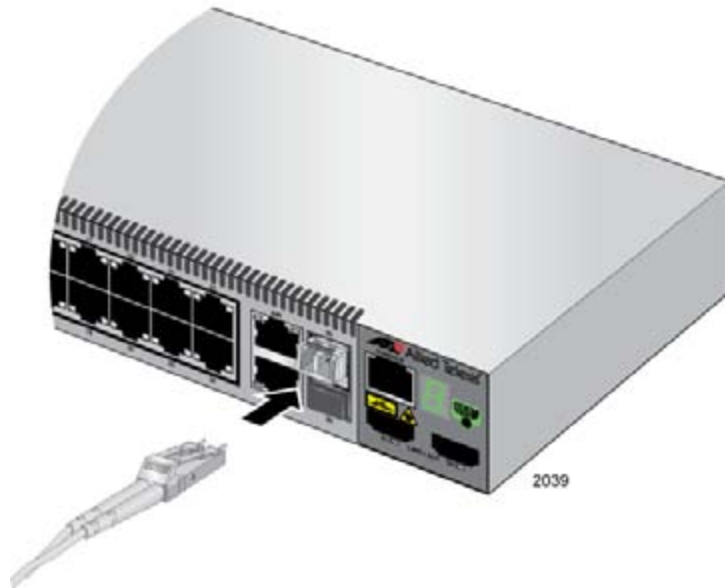


Figure 49. Connecting the Fiber Optic Cable to the SFP Module

8. Repeat this procedure if you have other SFP transceivers to install.

Managing the Stack

You may manage an 8100S Series stack with these methods and tools:

- ☐ Local management
- ☐ Telnet client
- ☐ Secure shell client
- ☐ Web browser
- ☐ SNMPv1, v2C, v3

Local Management

You may manage a stack through the Console port on the master switch. This is called local management or out-of-band management because the management sessions are not conducted over your network. The requirements for local management are listed here:

- ☐ A terminal or computer with a terminal emulator program
- ☐ The management cable included with the switch.

This management method uses the command line interface, which gives you access to all of the features and parameters on the stack. For instructions on how to start a local management session, refer to “Verifying and Setting the Stack ID Numbers” on page 82.

Note

Local management sessions of the stack must be conducted through the Console port of the master switch.

Telnet Management

The stack has a Telnet server so that you may manage it over your network with the Telnet application protocol. Commonly referred to as in-band management because it is conducted over the network, this management method has these requirements:

- ☐ Your management workstation must have a Telnet client.
- ☐ The Telnet server on the stack has to be activated. This is the server's default setting.
- ☐ The stack must have an IP address. You may use the factory 169.254.1.1 address assigned to the Default VLAN which contains all of the ports on the stack. For instructions on how to assign the stack a different address, refer to the *AT-8100 Series AlliedWare Plus Command Line Interface User's Guide*.
- ☐ You need to assign your management workstation an IP address 169.254.*n.n*, with the subnet mask 255.255.0.0 or your workstation must have access to that subnet through routing devices. The variable *n* can be from 1 to 255. You may not use the switch's IP

address 169.254.1.1. Refer to your computer's documentation for instructions on how to set the IP address.

Note

Your computer automatically defaults to an 169.254.*n.n* address if it is running a DHCP client and does not receive a response from a DHCP server. To have a DHCP client assign the address, disconnect your computer from your network, power it on, wait for the DHCP client to generate the IP address 169.254.*n.n*, and then connect the computer to your new 8100L or 8100S Series switch.

Telnet management uses the Command Line Interface, which gives you access to all of the features and parameter settings on the stack. For instructions on how to start a Telnet management session, refer to "Starting a Telnet Management Session" on page 83.

Telnet management sessions are not secure and are vulnerable to snooping because the management packets are sent in plain text. The security of the stack may be jeopardized if an intruder captures the packet containing your username and password. For secure remote management, use the secure shell protocol.

Secure Shell Management

Secure shell management is similar to Telnet management in that you may use it, together with the Command Line Interface, to manage all of the features and functions of the stack, from a workstation on your network. The difference is that this management method encrypts the packets exchanged by your computer and the stack to protect your management sessions.

Here are the requirements for SSH management:

- ❑ Your management workstation must have an SSH client.
- ❑ The SSH server on the stack has to be activated. The server's default setting is disabled.
- ❑ You have to create an encryption key on the stack.
- ❑ The stack must have an IP address. You may use the factory 169.254.1.1 address assigned to the Default VLAN.
- ❑ You need to assign your management workstation an IP address 169.254.*n.n* with the subnet mask 255.255.0.0 or your workstation must have access to that subnet through routing devices. The variable *n* can be from 1 to 255. You may not use the switch's IP address 169.254.1.1. Refer to your computer's documentation for instructions on how to set the IP address.

For instructions on how to configure the stack for SSH management, refer to the *AT-8100 Series AlliedWare Plus Command Line Interface User's Guide*.

Web Browser Management

Yet another way to remotely manage a stack is with a web browser. A special web browser interface, featuring both non-secure (HTTP) and secure (HTTPS) operation, lets you monitor and configure many of the switch's features from a series of windows. The interface, however, may only be used to configure a subset of the features. To configure those features the web browser interface does not support, you have to use the command line interface from another management method.

Here are the requirements for non-secure HTTP web browser management:

- ❑ Your management workstation must have a web browser.
- ❑ The web browser server on the switch has to be activated. This is the default setting in the default BOOT.CFG and QSTART.CFG files.
- ❑ The switch must have an IP address. You may use the factory 169.254.1.1 address assigned to the Default VLAN.
- ❑ You need to assign your management workstation an IP address in the 169.254.*n.n* subnet or your workstation must have access to that subnet through routing devices.

For instructions on how to start a web browser management session, refer to the *AT-8100L and AT-8100S Series AlliedWare Plus Web Browser User's Guide*

SNMP

Refer to the *AT-8100 Series AlliedWare Plus Command Line Interface User's Guide* for instructions on how to configure the stack for SNMP management. The switch does not have any default SNMP community strings.

Specifying Ports in the Command Line Interface for Switches in a Stack

The command line interface of the Local, Telnet, and SSH management methods gives you the ability to configure all of the features and parameters on the stack. Many of the commands feature the PORT parameter, which you use to identify the individual networking ports on the units in a stack. The parameter has the following format:

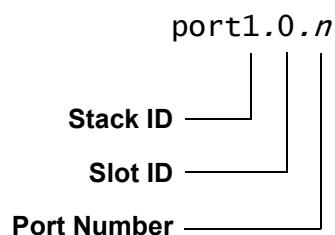


Figure 50. PORT Parameter in the Command Line Interface

The first number is the switch's stack ID number. The stack ID number for a switch in a stack is displayed by the Stack ID LED.

The slot ID value, which is used to specify slot numbers in a multi-module chassis, does not apply to 8100S Series switches and should always be 0.

The third value is a port number on the switch. You may specify one port number in a PORT parameter, but you may specify more than one PORT parameter in many of the commands that support the parameter.

Here is an example of the PORT parameter. It uses the INTERFACE command to enter the Port Interface mode for ports 15 and 17 on the switch with the stack ID 1:

```
awplus> enable
awplus# configure terminal
awplus(config)# interface port1.0.15,port1.0.17
```

In this example, the INTERFACE command enters the Port Interface mode for ports 1 to 18 on the switch with the stack ID 3:

```
awplus> enable
awplus# configure terminal
awplus(config)# interface port3.0.1-port3.0.18
```

For instructions on the command line interface and the PORT parameter, refer to the *AT-8100 Series AlliedWare Plus Command Line Interface User's Guide*.

Chapter 8

Troubleshooting

This chapter contains suggestions on how to troubleshoot the switch if a problem occurs.

Note

For further assistance, please contact Allied Telesis Technical Support. Refer to “Contacting Allied Telesis” on page 15.

Problem 1: The Stack ID LED on the front of the switch is off.

Solutions: The unit is not receiving power. Try the following:

- ☐ Verify that the power cord is securely connected to the power source and to the AC connector on the back panel of the switch.
- ☐ Verify that the power outlet has power by connecting another device to it.
- ☐ Try connecting the unit to another power source.
- ☐ Try a different power cord.
- ☐ Verify that the voltage from the power source is within the required levels for your region.

Problem 2: The SHOW STACK command does not display all the switches in the stack:

Solutions: You may have connected the stacking cables incorrectly or switches may have duplicate stack ID numbers. To correct the problem, try the following:

- ☐ Verify that the stacking cables are properly connected to the S1 and S2 ports such that they crossover to different ports. For instructions, refer to “Cabling the Stacking Ports” on page 87.
- ☐ Examine the stack ID LEDs to verify that each switch is assigned a unique ID number, in the range of 1 to 8. If there are switches with duplicate numbers, power off the stack and perform the procedures in Chapter 5, “Assigning the Stack ID Numbers and Cabling the Stacking Ports” on page 79. (The stack ID number must be set while the switch is functioning as a stand-alone unit.)

Problem 3: The stack ID LEDs on the switches of the stack are flashing the ID numbers and the letter “H” every few seconds.

Solution: This is normal for the LEDs when the switches are operating in a stack configuration.

Problem 4: All of the port LEDs are off even though the ports are connected to active network devices.

Solution: The LEDs may have been turned off. To toggle on the LEDs, press the eco-friendly button on the front panel. It is important to know that the eco-friendly buttons on the switches in a stack turn on and off the LEDs only on their respective units.

Problem 5: A twisted pair port on the switch is connected to a network device but the port’s LINK/ACT LED is off.

Solutions: The port is unable to establish a link to a network device. Try the following:

- ❑ Verify that the network device connected to the twisted pair port is powered on and is operating properly.
- ❑ Verify that the port is connected to the correct twisted pair cable. This is to eliminate the possibility that the port is connected to the wrong network device.
- ❑ Try connecting another network device to the twisted pair port with a different cable. If the twisted pair port is able to establish a link, then the problem is with the cable or the other network device.
- ❑ Verify that the twisted pair cable does not exceed 100 meters (328 feet).
- ❑ Verify that you are using the appropriate category of twisted pair cable. The cable types are listed in Table 6 on page 31 for the 10/100Base-TX ports and Table 7 on page 33 for the 10/100/1000Base-T ports.

Note

A 1000Base-T connection may require five to ten seconds to establish a link.

Problem 6: The LINK/ACT LED for an SFP transceiver is off.

Solutions: The fiber optic port on the transceiver is unable to establish a link to a network device. Try the following:

- ❑ Verify that the network device connected to the fiber optic port is operating properly.
- ❑ Verify that the fiber optic cable is securely connected to the port on the SFP module and to the port on the remote network device.

- ❑ Check that the SFP module is fully inserted in the slot.
- ❑ Verify that the operating specifications of the fiber optic ports on the SFP transceiver and the remote network device are compatible.
- ❑ Verify that the correct type of fiber optic cabling is being used.
- ❑ Verify that the port is connected to the correct fiber optic cable. This is to eliminate the possibility that the port is connected to the wrong remote network device.
- ❑ Try connecting another network device to the fiber optic port using a different cable. If the port is able to establish a link, then the problem is with either the cable or the other network device.
- ❑ Use the switch's management software to verify that the port is enabled.
- ❑ If the remote network device is a managed device, use its management firmware to determine whether its port is enabled.
- ❑ Test the attenuation on the fiber optic cable with a fiber optic tester to determine whether the input optical signal is too weak (sensitivity) or too strong (maximum input power).

Problem 7: Network performance between a twisted pair port on the switch and a network device is slow.

Solution: There might be a duplex mode mismatch between the port and the network device. This occurs when a twisted pair port set to Auto-Negotiation is connected to a device with a fixed duplex mode of full duplex. If this is the cause of the problem, adjust the duplex mode of the port on the network device or on the switch so that both ports are using the same duplex mode.

Problem 8: The switch functions intermittently.

Solutions: Check the system hardware status through the management software:

- ❑ Use the SHOW SYSTEM ENVIRONMENT command in the Privileged Exec mode to verify that the input voltage from the power source to the switch is stable and within the approved operating range. The unit will shutdown if the input voltage fluctuates above or below the approved operating range.
- ❑ For switches that have a ventilation fan, use the SHOW SYSTEM ENVIRONMENT command in the Privileged Exec mode to verify the operating status of the fan.
- ❑ Verify that the location of the switch allows for adequate airflow. The unit will shutdown if it overheats.

Chapter 9

Adding or Removing Switches

The procedures in this chapter explain how to add or remove switches from the stack. The chapter contains the following sections:

- ❑ “Removing or Replacing the Master Switch” on page 120
- ❑ “Adding a New Member Switch” on page 128
- ❑ “Removing a Member Switch” on page 130

Removing or Replacing the Master Switch

This procedure is divided into the following phases:

- ❑ Phase 1: “Uploading the Active Configuration File” on page 121
- ❑ Phase 2: “Removing the Current Master Switch” on page 122
- ❑ Phase 3: “Configuring the New Master Switch” on page 125
- ❑ Phase 4: “Connecting the New Master Switch to the Stack” on page 127

The procedures should be performed in the order presented here.

Here are the guidelines to removing or replacing the master switch:

- ❑ When you power off the master switch, the member switch that has the lowest ID number of the remaining switches automatically assumes the role of the master switch of the stack.
- ❑ The new master switch should be the same model as the current master switch. Otherwise, the operations of the stack may be unpredictable. For instance, you should not replace an AT-8100S/16F8-SC Switch with an AT-8100S/24 Switch.
- ❑ You should not connect the new master switch to the stack until after you have installed the stack’s configuration file on it. Otherwise, the entire stack configuration may be lost. The procedure for this is in “Uploading the Active Configuration File” on page 121 and “Configuring the New Master Switch” on page 125.

In phase 2 it may be necessary to power off the stack. Here are the guidelines to determining whether that will be necessary:

- ❑ You may leave the stack powered on if it is cabled in the duplex-ring topology, or if it is cabled in the duplex-chain topology and the master switch is at the end of the stack.
- ❑ You should power off the stack if it is wired in the duplex-chain topology and the master switch is located between other switches.

Note

For background information on stack topologies, refer to “Stacking Port Topologies” on page 55.

Uploading the Active Configuration File

The first step to replacing the master switch of the stack is to upload the active boot configuration file, which contains the configuration settings of the stack, to your workstation or, alternatively, to a TFTP server. You'll download the file to the new switch later in these procedures.

If the current master switch is nonfunctional, perform this procedure on whichever active switch in the stack has the lowest stack ID number.

This procedure explains how to upload the file using Zmodem from a local management session. You may also upload the file from a Telnet, SSH or web browser session. For instructions, refer to the *AT-8100 Series AlliedWare Plus Command Line Interface User's Guide* or *AT-8100 Series AlliedWare Plus Web Browser User's Guide*.

To upload the active configuration file from the current master switch from a local management session, perform the following procedure:

1. Start a local management session on the current master switch or, if the master switch is not functional, on whichever switch is the current master switch. (The master switch has the lowest stack ID number.) For instructions, refer to "Starting a Local Management Session" on page 82.
2. Move to the Privileged Exec mode with the ENABLE command and enter the SHOW BOOT command to identify the name of the active configuration file:

```
awplus> enable
awplus# show boot
```

Here is an example of the information the command displays.

```
Current software: 2.2.0
Current boot image: 2.2.0
Default boot config : /cfg/boot.cfg
Current boot config : /cfg/stack_eng.cfg (file exists)
```

Figure 51. SHOW BOOT Command

The name of the active boot configuration file is displayed in the "Current boot config" line.

3. Use the COPY FILENAME ZMODEM command in the Privileged Exec mode to upload the file to your workstation. Here is the format of the command:

```
copy filename.cfg zmodem
```

The *filename* variable is the name of the active boot configuration file displayed with the SHOW CONFIG command in the previous step. Be

sure to include the .CFG extension. This example of the command uploads a configuration file called stack_eng.cfg:

```
awp1us# copy stack_eng.cfg zmodem
```

4. After you enter the command, begin the file transfer using your terminal emulator program. The upload, which takes only a few seconds, is completed when the command prompt is displayed again.
5. Go to the next procedure.

Removing the Current Master Switch

Now that you have uploaded the configuration file to your workstation, you may remove the master switch from the stack and equipment rack.

1. Power off the master switch by disconnecting the power cord from the power source and the back panel of the switch.

If you are not powering off the stack, the remaining switches perform the following actions:

- ☐ The member switch which has the lowest ID number among all of the remaining switches is selected as the new master switch.
 - ☐ The new master switch configures all of the switches using its active boot configuration file.
 - ☐ The new master switch transmits its active boot configuration file to the other switches, over the stacking ports.
2. Label and disconnect all of the network cables from the twisted pair and fiber optic ports on the master switch. For example, label the cable connected to port 1 with "1.0.1." Labelling the cables makes it easier to cable the new master switch.

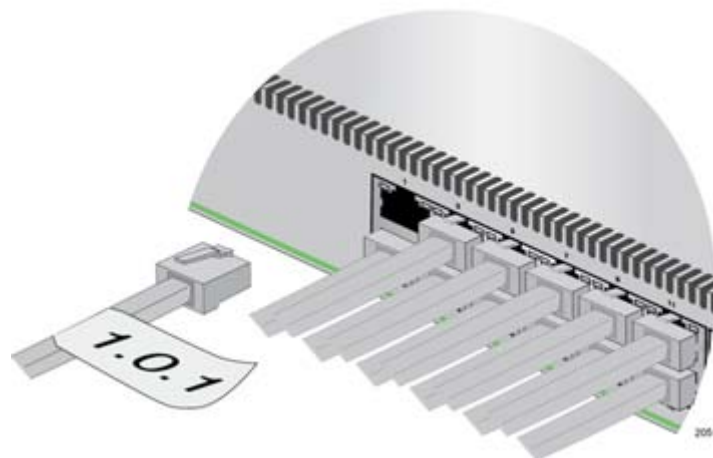


Figure 52. Removing the Network Cables

Note

If the switch has SFP modules, perform steps 3 to 7. Otherwise, go to step 8.

3. Label and remove the fiber optic cable from the SFP module.

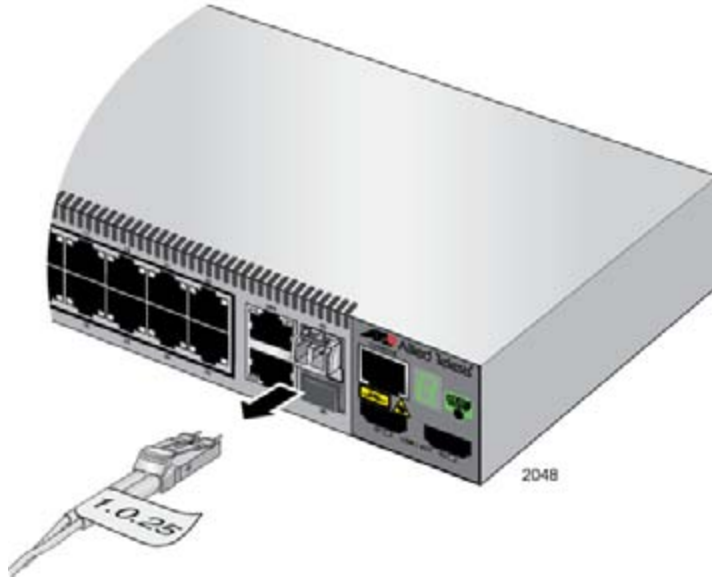


Figure 53. Removing the Fiber Optic Cable from the SFP Module

4. Install the dust cover on the fiber optic port.



Figure 54. Installing the Dust Cover on the SFP Module

5. Remove and label the module from the switch, as shown in Figure 55.

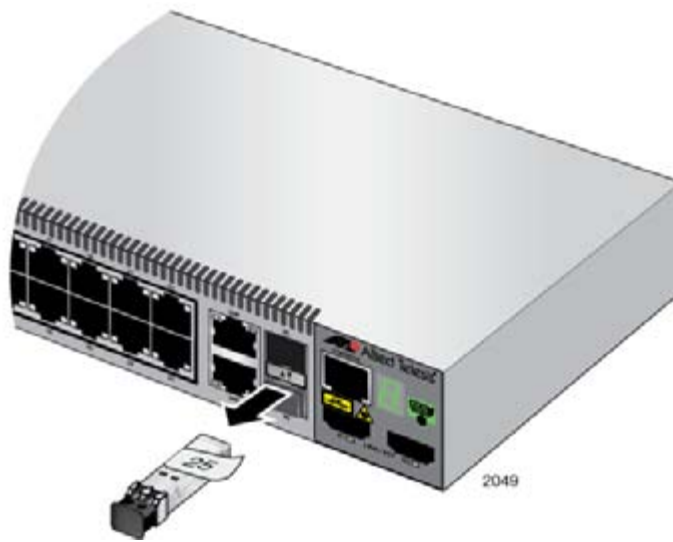


Figure 55. Removing the SFP Module

6. Install the dust cover in the SFP slot, as shown in Figure 56.



Figure 56. Installing the Dust Cover in the SFP Slot

7. If the switch has two SFP modules, repeat steps 3 to 6 to remove the second module.
8. Label and disconnect the stacking cables from the stacking ports on the front panel of the switch, as shown in Figure 57 on page 125.



Figure 57. Removing the Stacking Cables

9. Remove the switch from the equipment rack.
10. Go to the next procedure.

Configuring the New Master Switch

With the master switch removed from the equipment rack, you are ready to install the new master switch by configuring its stack ID number and downloading the configuration file. These steps must be performed before the switch is connected to the stack. To configure the new master switch, perform the following procedure:

1. Install the new master switch in the equipment rack. For instructions, refer to Chapter 4, “Installing and Labeling the Switches in an Equipment Rack” on page 71.
2. Add a label to the front panel of the new switch or adjacent to it on the equipment rack, with the unit’s MAC address, found on the back panel, and its stack ID number. The stack ID number for the master switch is usually 1. For background information, refer to “Stacking Guidelines” on page 52 and “Labeling the Switches” on page 77.
3. Power on the switch by connecting the power cord to the back of the switch and to a power source.
4. After the switch initializes its management software, start a local management session, as explained in “Verifying and Setting the Stack ID Numbers” on page 82.

5. Assign the switch its stack ID number. For instructions, refer to “Changing the Stack ID Number” on page 85.
6. After configuring the stack ID number, reestablish your local management session.
7. Download onto the switch the configuration file you uploaded earlier from the previous master switch or from one of the member switches. To download the file from your computer to the file system in the switch, go to the Privilege Exec mode and enter the COPY ZMODEM command, as shown here:

```
awplus> enable
awplus# copy zmodem
```

You will see this prompt:

```
waiting to receive ...
```

8. Use your terminal or terminal emulator program to download the boot configuration file to the switch. The download must be Zmodem.

After receiving the entire file, the switch stores it in the file system.

9. To confirm that the switch received the file, use the DIR command in the Privileged Exec mode to list the files in the file system.
10. To designate the file as the active boot configuration file on the switch, use the BOOT CONFIG-FILE command in the Global Configuration mode:

```
boot config-file filename.cfg
```

This example of the command designates “stack_eng.cfg” as the switch’s new active boot configuration file:

```
awplus# configure terminal
awplus(config)# boot config-file stack_eng.cfg
```

Note

Do not issue the WRITE or COPY RUNNING-CONFIG STARTUP-CONFIG command because if you do, the switch overwrites all of the settings in the configuration file with its current settings. If you inadvertently enter the command, download the configuration file again from your workstation, starting with step 6.

11. Use the EXIT command to return to the Privileged Exec mode and Issue the SHOW CONFIG command to verify that the downloaded configuration file is the new active configuration file. The “Current boot config” field should contain the name of the configuration file you designated in step 9.

```
awplus(config)# exit
awplus# show boot
```

12. Power off the new master switch.
13. Go to the next procedure.

Connecting the New Master Switch to the Stack

To connect the stacking and network cables to the new master switch, perform the following procedure:

1. Cable the stacking ports on the new master switch. For instructions, refer to “Cabling the Stacking Ports” on page 87.
2. Power on the new master switch. For instructions, refer to “Powering on AC Switches” on page 92 or “Powering On DC Switches” on page 97.

At this point, the new master switch performs the following actions:

- ☐ It initializes its management software and features.
- ☐ It assumes the role as master switch of the stack.
- ☐ It configures the settings of all the member switches using the settings in its active boot configuration file.
- ☐ It transmits its active boot configuration file to the other switches in the stack.

To monitor these processes, refer to “Monitoring the Initialization Processes” on page 93.

3. To verify that the new master switch is operating properly, perform the steps in “Verifying the Installation” on page 101.
4. Connect the twisted pair and fiber optic cables to the ports on the switch. For instructions, refer to “Cabling the Twisted Pair and Fiber Optic Ports” on page 104.
5. Install any optional SFP modules in the master switch. For instructions, refer to “Installing Optional SFP Transceivers” on page 106.

Adding a New Member Switch

Here are the guidelines to adding a new member switch to a stack:

- ❑ You have to power off a stack to add new member switches. To minimize the disruption to network users, you should add new switches to a stack during non-business hours.
- ❑ Adding a new member switch to an active stack is not recommended because it may cause unpredictable results.
- ❑ The configurations settings on a new member switch in a stack are returned to the default settings. If a new member switch was used as a stand-alone unit in your network and you want it to have the same configuration in the stack, you have to recreate the configuration after connecting it to the stack.
- ❑ A stack may not have more than eight switches.
- ❑ The correct sequence of steps to adding a new switch to an existing stack is to assign the ID number and then power it off before connecting it to the stack.
- ❑ A new member switch automatically becomes the new master switch of the stack if it has a lower ID number than the current master switch. This may cause the stack to lose its configuration.
- ❑ Before adding a new switch to an existing stack, check that its version of the AlliedWare Plus management software is the same as the other switches. If necessary, update the management software on the switch before adding it to the stack.

Here are the steps to perform on the new member switch before adding it to the existing stack:

1. If the new member switch is currently operating as a stand-alone device in your network and you want it to have the same configuration when it is part of the stack, upload its configuration file to your workstation or a TFTP server. perform these steps:
 - a. Start a local management session on the switch. For instructions, refer to “Verifying and Setting the Stack ID Numbers” on page 82.
 - b. Move to the Privileged Exec mode with the ENABLE command and enter the SHOW BOOT command to identify the name of the active boot configuration file:

```
awplus> enable
awplus# show boot
```


- c. If the “Current boot config” field is displaying the filename BOOT.CFG, perform this command to create an archive copy of it. Otherwise, go to step 2.

```
awplus# copy boot.cfg archive_boot.cfg
```

- d. Log off by entering the EXIT command.

2. Power off the switch.
3. Label and disconnect all of the network cables from the ports.
4. Install the switch in the same equipment rack as the stack. For instructions, refer to Chapter 4, “Installing and Labeling the Switches in an Equipment Rack” on page 71.
5. Add a label to the front panel of the switch or adjacent to it on the equipment rack, with the unit’s MAC address, found on the back panel, and the unique stack ID number you intend to assign it. This should be the next available ID number. For instructions, refer to “Stacking Guidelines” on page 52 and “Labeling the Switches” on page 77.
6. Assign the new switch its unique stack ID number. For instructions, refer to “Assigning the Stack ID Numbers and Cabling the Stacking Ports” on page 79.
7. Power off the new member switch.
8. Power off the stack.
9. Connect the new member switch to the stack by cabling the stacking ports. For instructions, refer to “Cabling the Stacking Ports” on page 87.
10. Power on the stack. For instructions, refer to “Powering on AC Switches” on page 92 or “Powering On DC Switches” on page 97.
11. Verify that the stack is operating properly with the new member switch. For instructions, refer to “Verifying the Installation” on page 101.
12. Cable the twisted pair and fiber optic ports on the new switch. Refer to “Cabling the Twisted Pair and Fiber Optic Ports” on page 104.
13. Install and cable any optional SFP transceivers. Refer to “Installing Optional SFP Transceivers” on page 106.

Removing a Member Switch

Here are the guidelines to removing a member switch from the stack:

- ❑ You may leave the stack powered on if it is cabled in the duplex-ring topology, or if it is cabled in the duplex-chain topology and the switch to be removed is located at the end of the stack.
- ❑ You should power off the stack if it is wired in the duplex-chain topology and the member switch to be removed is located between other switches.

Note

For background information on stack topologies, refer to “Stacking Port Topologies” on page 55.

- ❑ If you plan to replace a member switch, the new switch must be the same model as the switch it is replacing. Otherwise, the operations of the stack may be unpredictable. For instance, you should not replace an AT-8100S/16F8-SC Switch with an AT-8100S/24 Switch.
- ❑ Removing a member switch from an operational stack disrupts IP connectivity until the stack reforms. However, Layer 2 traffic is not disrupted.

Here are the steps to removing a member switch from an operational stack.

1. Power off the member switch.
2. Label and disconnect all of the network cables from the switch.
3. Label and disconnect the stacking cables.
4. To replace the switch with another switch, go to “Adding a New Member Switch” on page 128. Otherwise, continue with the next step.
5. Connect the stacking cables to the remaining switches.
6. Verify that the stack is operating properly. Refer to “Verifying the Installation” on page 101.
7. If you want to use the removed member switch as a stand-alone unit, set its ID number to 0. For instructions, refer to Chapter 5, “Assigning the Stack ID Numbers and Cabling the Stacking Ports” on page 79.

Refer to Chapter 8, “Troubleshooting” on page 115 if there are any problems.

Appendix A

Technical Specifications

This appendix contains the technical specifications for the 8100S Series Switches. For the technical specifications for the non-stacking 8100L Series switches, refer to the *Stand-alone Switch Installation Guide for 8100L and 8100S Series Switches*.

Physical Specifications

Dimensions (H x W x D)

Table 17. Product Dimensions

AT-8100S/24C	4.4 cm x 33.0 cm x 20.3 cm (1.7 in. x 13.0 in. x 8.1 in.)
AT-8100S/24 AT-8100S/24F-LC	4.4 cm x 44.1 cm x 29.1 cm (1.7 in. x 17.3 in. x 11.5 in.)
AT-8100S/24POE AT-8100S/16F8-SC AT-8100S/16F8-LC	4.4 cm x 44.1 cm x 32.2 cm (1.7 in. x 17.3 in. x 12.7 in.)

Weights

Table 18. Product Weights

AT-8100S/24C	2.2 kg (4.8 lb.)
AT-8100S/24	3.6 kg (8.0 lb.)
AT-8100S/24POE	5.0 kg (11.0 lb.)
AT-8100S/16F8-SC	4.1 kg (9.1 lb.)
AT-8100S/16F8-LC	4.4 kg (9.75 lb.)
AT-8100S/24F-LC	4.4 kg (9.75 lb.)

Ventilation

Table 19. Ventilation Requirements

Recommended Minimum Ventilation on All Sides	10 cm (4.0 in)
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Environmental Specifications

Table 20. Environmental Specifications

Operating Temperature	0° C to 40° C (32° F to 104° F)
Storage Temperature	-25° C to 70° C (-13° F to 158° F)
Operating Humidity	5% to 90% noncondensing
Storage Humidity	5% to 95% noncondensing
Maximum Operating Altitude	3,048 m (10,000 ft)
Maximum Nonoperating Altitude	4,000 m (13,100 ft)

Power Specifications

Maximum Power Consumptions

Table 21. Maximum Power Consumptions

AT-8100S/24C	18.3 watts
AT-8100S/24	19.5 watts
AT-8100S/24POE	459.3 watts
AT-8100S/16F8-SC	22 watts
AT-8100S/16F8-LC	22 watts
AT-8100S/24F-LC	22 watts

Input Voltages

Table 22. Input Voltages

AT-8100S/24C	AC model: 100-240 VAC, 1.0 A maximum, 50/60 Hz per input
--------------	--

Table 22. Input Voltages (Continued)

AT-8100S/24	AC model: 100-240 VAC, 1.0 A maximum, 50/60 Hz per input DC model: 40-60 VDC, 1.5 A maximum per input
AT-8100S/24POE	AC model: 100-240 VAC, 3.0 A maximum, 50/60 Hz per input
AT-8100S/16F8-SC	AC model: 100-240 VAC, 1.0 A maximum, 50/60 Hz per input
AT-8100S/16F8-LC	AC model: 100-240 VAC, 1.0 A maximum, 50/60 Hz per input
AT-8100S/24F-LC	AC model: 100-240 VAC, 1.0 A maximum, 50/60 Hz, per input

Certifications

Table 23. Product Certifications

EMI (Emissions)	FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI Class A, CISPR Class A, C-TICK, CE
EMC (Immunity)	EN55024
Electrical and Laser Safety	EN60950-1 (TUV), UL 60950-1 (CULUS), EN60825
Compliance Marks	CE, CULUS, TUV, C-Tick

Quality and Reliability

Table 24. MTBF

AT-8100S/24C	510,000 hours
AT-8100S/24	430,000 hours
AT-8100S/24POE	70,000 hours
AT-8100S/16F8-SC	190,000 hours

Table 24. MTBF (Continued)

AT-8100S/16F8-LC	170,000 hours
AT-8100S/24F-LC	140,000 hours

RJ-45 Twisted Pair Port Pinouts

Figure 58 illustrates the pin layout of an RJ-45 connector and port.

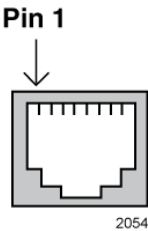


Figure 58. RJ-45 Connector and Port Pin Layout

Table 25 lists the pin signals for 10 and 100 Mbps.

Table 25. Pin Signals for 10 and 100 Mbps

Pin	MDI Signal	MDI-X Signal
1	TX+	RX+
2	TX-	RX-
3	RX+	TX+
4	Not used	Not used
5	Not used	Not used
6	RX-	TX-
7	Not used	Not used
8	Not used	Not used

Table 26 lists the pin signals when a port operating at 1000 Mbps.

Table 26. Pin Signals - 1000 Mbps

Pinout	Pair
1	Pair 1 +
2	Pair 1 -
3	Pair 2 +
4	Pair 3 +
5	Pair 3 -
6	Pair 2 -
7	Pair 4 +
8	Pair 4 -

Fiber Optic Port Specifications

Table 27 lists the specifications of the 100Base-FX fiber optic ports on the AT-8100S/16F8-SC Switch.

Table 27. Fiber Optic Port Specifications for the AT-8100S/16F8-SC Switch

General	
Maximum Distance	2 km
Fiber Optic Cable	50/125 or 62.5/125 μm (core/cladding) multimode fiber optic cable
Transmitter	
Wavelength	1310 nm
Output optical power with 50/125 μm (core/cladding) multimode fiber optic cable (BOL)	minimum: -22.5 dBm maximum: -14 dBm
Output optical power with 62.5/125 μm (core/cladding) multimode fiber optic cable (BOL)	minimum: -19 dBm maximum: -14 dBm

Table 27. Fiber Optic Port Specifications for the AT-8100S/16F8-SC Switch (Continued)

Receiver	
Wavelength	1310 nm
Sensitivity	Maximum: -31.8 dBm
Maximum Input Power	Minimum: -14 dBm

Table 28 lists the specifications of the 100Base-FX fiber optic ports on the AT-8100S/16F8-LC and AT-8100S/24F-LC Switches.

Table 28. Fiber Optic Port Specifications for the AT-8100S/16F8-LC and AT-8100S/24F-LC Switches

General	
Maximum Distance	2 km
Fiber Optic Cable	50/125 or 62.5/125 μm (core/cladding) multimode fiber optic cable
Transmitter	
Wavelength	1310 nm
Output optical power with 50/125 μm (core/cladding) multimode fiber optic cable (BOL)	Minimum: -23.5 dBm Maximum: -14 dBm
Output optical power with 62.5/125 μm (core/cladding) multimode fiber optic cable (BOL)	Minimum: -20 dBm Maximum: -14 dBm
Receiver	
Wavelength	1310 nm
Sensitivity	Maximum: -31 dBm
Maximum Input Power	Minimum: -8 dBm

RJ-45 Style Serial Console Port Pinouts

Table 29 lists the pin signals of the RJ-45 style serial Console port.

Table 29. RJ-45 Style Serial Console Port Pin Signals

Pin	Signal
1	Looped to pin 8.
2	Looped to pin 7.
3	Transmit Data
4	Ground
5	Ground
6	Receive Data
7	Looped to pin 2.
8	Looped to pin 1.

Stacking Port Pinouts

Figure 59 illustrates the pin layout of the S1 and S2 stacking ports.

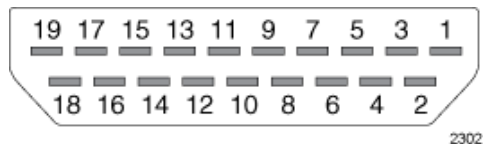


Figure 59. Stacking Port Pin Layout (Front View)

Table 30 lists the pin signals for the stacking ports.

Table 30. Stacking Port Pin Signals

Pin	S1 Port	S2 Port
1	Not connected	Not connected
2	Ground	Ground
3	Not connected	Not connected

Table 30. Stacking Port Pin Signals (Continued)

Pin	S1 Port	S2 Port
4	Transmit data1+	Receive data1+
5	Ground	Ground
6	Transmit data1-	Receive data1-
7	Receive data0+	Transmit data0+
8	Ground	Ground
9	Receive data0-	Transmit data0-
10	Not connected	Not connected
11	Ground	Ground
12 to 19	Not connected	Not connected